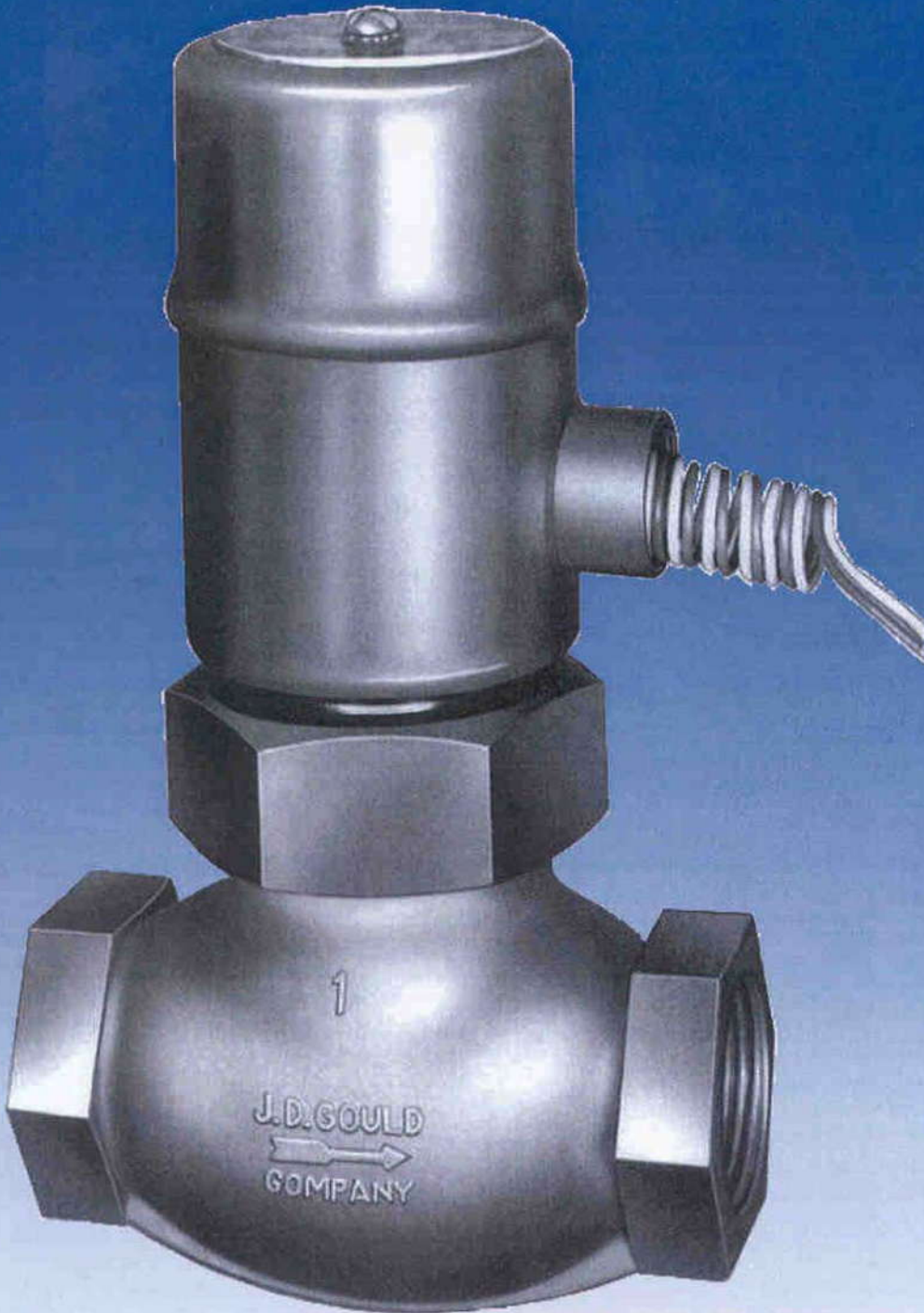


Application Information



Solenoid Valves

J. D. Gould Company, Inc. www.mmcontrol.com/gouldvalve

Distributed By: M&M Control Service, Inc. phone: 800.876.0036 • fax: 847.356.0747

• e-mail: sales@mmcontrol.com

J.D. Gould Company, Inc.

SOLENOID VALVES



TYPICAL SOLENOID VALVE USES BY INDUSTRY

Valve Applications	Recommended GOULD Valve
AIR-POLLUTION CONTROL:	
Wash-down valves for Air Filters	Types M-3V & Q-3V
Ultrasonic Cleaning Equipment	Type M-3V
AUTOMOTIVE:	
Various Assembly Plant Maintenance Uses	Air/Water/Steam Valves
Hydraulic Lifting Equipment	Types Q4, BL, DL
Tire-Tread Forming Equipment (Heating w/Steam & Water Cooling)	Types M-3V & M-1-3T
Auto/Truck Washes (Wash/ Rinse/ Valves)	Types M-3V/Q-3V/B3-21
CONCRETE:	
Metered Batching Systems (Water Mixing)	Types M-90 & Q-90
Down-leveling Valves	Types BL & DL
FOOD PROCESSING MACHINERY:	
Bottle Washers (Sanitizing)	Types D, M-3V & Q-3V
Poultry Feeding Systems (Water)	Type M-3 V
Hen House Wash-down Systems	Type M-3V
Bakeries: Pot/Pan Cleaning Spray Arms Spraying Oil on Top of Rolls Bun Warmers (Steam)	Types F, G, M-3V & M-1-3T Types F & G Type B3-19
In-Plant Bulk Transport (e.g. Vinegar, Milk, Bourbon, etc.)	Various Types (Primarily Types G, GX, K & KX)
GENERATING EQUIPMENT.	
Diesel/Gasoline Generating Systems	Types Q-230 & K-230
Standby Generators (Water Coolant Systems)	Type M4-3V
HOSPITAL EQUIPMENT	
Various Temperature Control Devices	Types M-3V & M-1-3T
Commercial Dishwashers	Type M-3V-8
Various Gas/Air/Water Uses	Variety of Types
Boiler Feed Valves	Types M-3V & M-1-3T

SOLENOID VALVES



TYPICAL SOLENOID VALVE USES BY INDUSTRY (Continued)

Valve Applications	Recommended GOULD Valve
INDUSTRIAL MACHINERY	
Air Compressor/ Machine Coolant Systems	Types M-3V
Boiler Feed Units (Check Temperature Rating)	Types M-3V & M-1-3T
Deluge Systems (Smoke Stack Fire Prevention)	Type M4-3V; Q4-3V & DST
De-Ionized Water Systems	Type KX-3EP-EP-62
Hydraulic Dock Lifts	Types Q4-3V; BL & DL
In-Plant Maintenance (Air/Water/Oil /Steam)	Various Types (Consult Factory)
Metal "Cold" treating	Many "-9" Types
Sandblasting Equipment (Wet or Dry Systems)	Types M-3V
Sequential Process Re-starting after Power Fails	All Types Q-57 & K-57
Standby Generators (Coolant Systems)	Types M4-3V [12V/D.C.]
Steel Mills/Foundries - Quench Baths (Water Induction Systems)	Types M-3V & Q-3V
INSTRUMENTATION/GAUGE/CONTROLS:	
Automatic Gasoline/Diesel Fuel Pumps	Type Q-230
Valves involved with Control Panels	Various Types (Consult Factory)
LAUNDRY & DRY CLEANING EQUIPMENT	
"Pants Toppers" - Steam valves	Types B3-19 & BH-19
Dry Steam for Re-shaping drapes	Type Q-1-3T
Commercial Laundry Machines (Wash/Rinse Valves)	Types Q-3V & Q1-3T
MINING EQUIPMENT	
Dust Control Systems (Spray-down)	Types QW & DST
Water Management	Types M-3V & Q-3V
PAPER/PULP MILLS:	
Sawdust Control (Spray-down)	Type M-3V
Hydraulic Lifts	Types Q4-3V; BL & DL
Log Misting Systems	Types M-3V & Q-3V
Misc. Chemical Handling	Types K-3T & KX-3T
Pneumatic Systems	Types M-3B & Q-3B
Process Heating	Types Q-1-3T, M-1-3T, K-1-3T

SOLENOID VALVES



TYPICAL SOLENOID VALVE USES BY INDUSTRY (Continued)

Valve Applications	Recommended GOULD Valve
PETROCHEMICAL:	
Off Shore Oil Rigs	K-3V-V-2
Gasoline, Diesel & Fuel Oil Distribution	Q-230 & K-230
Pipeline Applications	Various Types
PLATING:	
Fill/Wash Cycle on Plating Tanks	Types M-3V & Q-3V
TRANSPORTATION:	
Aircraft Refueling Systems	Types K-230, Q-230, EF-3V
Railroad Refueling Systems	Type QW-2 & QW-88-2
Aircraft De-Icing Systems	Type Q-3V-76
Plane, Train & Automobile Wash Systems	Types Q-3V, D-3T, M-3V, K-3T
Train Switch De-Icers (Steam/Glycol)	Various Types (Consult Factory)
RECREATION:	
Swimming Pools: Fill Water	Type M-3V
Whirlpools: Fill Water	Type M-3V & B-3V
RESTAURANT EQUIPMENT	
Commercial Dishwashers (Wash/Rinse)	Type M-3V-8
Pot/Pan Washers	Type M-3V-8 & M-1-3T
SEWAGE TREATMENT/WATER PURIFICATION/FILTRATION/DESALINIZATION:	
Water Filtration Systems (Various Stages)	Types M-3V; Q-3V & KX-3V
Flow control for Ultraviolet Purifying Systems	Types M-3V; Q-3V & KX-3V
SPRINKLER & IRRIGATION SYSTEMS:	
Farm Sprinkler & Irrigation Systems	All Types
Lawn Sprinkler Systems	All Types
TEXTILE:	
Process Heating	Types M-1-3T & Q-1-3T
Sizing/ Drying/ Forming Nylon Stockings (Coolant System)	Types QD & KD
Hosiery Mills	Types K & KX

GOULD SOLENOID VALVE APPLICATION GUIDE

SOLENOID VALVES

FLOW DETAIL AND COIL SPECS

Cv FACTORS FOR GOULD SOLENOID VALVES

SEE "SOLENOID VALVE SELECTOR" ON OUR WEBSITE TO CALCULATE FLOW OR PRESSURE DROP, OR CONSULT FACTORY.

TYPE A SERIES: (Pipe Size)	1/4" = 1.2
	3/8" = 2.0
TYPE B SERIES: (Pipe Size)	1/4" = 1.9
	3/8" = 2.8
	1/2" = 3.3
TYPE B3 SERIES: 1/4" or 3/8" NPT (Orifice Size)	3/16" = 0.70
TYPE D SERIES: (Pipe Size)	3/4" = 6.3
	1" = 11.5
	1-1/4" = 18.0
	1-1/2" = 28.0
	2" = 50.0
TYPES F & G: 1/8" - 3/8" (Orifice Size)	1/4" = 1.2
	7/32" = 1.0
	3/16" = 0.70
	5/32" = 0.50
	1/8" = 0.30
	3/32" = 0.18
	1/16" = 0.08
3/64" = 0.03	

TYPE K SERIES: (Pipe Size)	1/8" = 1.1
	1/4" = 2.1
	3/8" = 3.2
	1/2" = 3.9
	3/4" = 7.5
	1" = 9.9
	1-1/4" = 23.0
	1-1/2" = 25.0
	2" = 45.0
Type M SERIES: (Pipe Size)	1/8" = 1.3
	1/4" = 2.1
	3/8" = 2.3
	1/2" = 3.9
	3/4" = 5.1
	1" = 11.6
	1-1/4" = 12.1
	1-1/2" = 26.0
	2" = 48.0

TYPE Q SERIES: (Pipe Size)	1/8" = 1.3
	1/4" = 2.1
	3/8" = 2.3
	1/2" = 3.9
	3/4" = 5.1
	1" = 11.6
	1-1/4" = 12.1
	1-1/2" = 26.0
	2" = 48.0
	2-1/2" = 75.0
3" = 100.0	

STANDARD PILOT ORIFICE/PRESSURE RATING FOR GOULD SOLENOID VALVES

TYPE M – AIR & WATER					
ORIFICE	1/8"	7/64"	3/32"	5/64"	DRILL
PRESSURE	100	125	200	250	PSI

ALL OTHER TYPES*						
STANDARD COIL			ORIFICE	EXTRA STRONG COIL		
AIR (psi)	WATER (psi)	OIL (psi)		AIR (psi)	WATER (psi)	OIL (psi)
200	100	75	1/8"	400	180	50
300	150	100	7/64"		220	100
500	200	150	3/32"		350	200
	300		5/64"		450	300
	500		1/16"		600	500
			3/64"		1200	1200

NOTE: For Steam Orifice Sizes – Use Air to Maximum of 200 psi.

*Except Type KX – CONSULT FACTORY

COIL SPECIFICATIONS FOR GOULD SOLENOID VALVES

(For non-standard voltages or 50hz applications consult factory)

VALVE TYPE	VOLTAGE	COIL #	INSULATION CLASS MAX. FLUID TEMP.		INRUSH Current (A)	HOLDING Current (A)	WATTS
M	120/240/50/60	96012	H450°F	120/60 240/60	0.75 0.38	0.35 0.18	18 18
B3	120/240//60	75012	F300°F	120/60 240/60	0.72 0.36	0.26 0.13	14 14
M	12/60	H12A	H 450°F		8.40	4.20	18
B3	12/60	75H12	F 300°F				
All Other	12/60	1547	F 300°F				
All Other	12/60	2540	H 450°F				
M	24/60	H24A	H 450°F		3.10	1.54	17
B3	24/60	7507	F 300°F				
B3	24/60	75H7	H 450°F		4.60	2.30	20
All Other	24/60	L555	F 300°F				
All Other	24/60	1144	H 450°F		1.90	0.95	18
All Other	24/60	1347	H 450°F				
All Other	55/60	L757	F 300°F		1.30	0.64	18
M	120/60	H1A	H 450°F		0.70	0.35	17
B3	120/60	7501	F 300°F				
B3	120/60	75H1	H 450°F		0.72	0.36	15
All Other	120/60	1138	F 300°F				
All Other	120/60	1386	F 300°F		1.00	0.60	18
All Other	120/60	1143	H 450°F				
M	240/60	H2A	H 450°F		0.36	0.18	18
B3	240/60	7502	F 300°F				
B3	240/60	75H2	H 450°F		0.36	0.13	15
All Other	240/60	1139	F 300°F				
All Other	240/60	1223/1224	F 300°F		0.50	0.30	26
All Other	240/60	1142	H 450°F				
M	480/60	H3A	H 450°F		0.22	0.11	19
B3	480/60	7503	F 300°F				
All Other	480/60	1140	F 300°F		0.16	0.08	14
All Other	480/60	1387	F 300°F				
All Other	480/60	1141	H 450°F		0.20	0.10	20
All Other	550/60	1797	F 300°F				
All Other	550/60	1145	H 450°F		0.20	0.10	26
M	6 DC	6HD	H 450°F		-	-	-
B3	6 DC	6750	F 300°F		-	4.00	24
All Other	6 DC	1347	H 450°F		-	4.20	24
M	12 DC	12HD	H 450°F		-	1.80	22
B3	12 DC	75H12	H 450°F		-	-	-
B3	12 DC	12750	F 300°F		-	2.00	24
All Other	12 DC	1314	F 300°F		-	2.00	24
All Other	12 DC	1314H	H 450°F		-	2.00	24
All Other	18 DC	1751	H 450°F		-	1.40	25
M	24 DC	24HD	H 450°F		-	1.00	24
B3	24 DC	24750	F 300°F		-	1.00	24
All Other	24 DC	1315	F 300°F		-	1.00	24
All Other	24 DC	1751	H 450°F		-	1.85	48
All Other	32 DC	1149	F 300°F		-	0.75	24
All Other	32 DC	1751	H 450°F		-	2.40	76
M	48 DC	48HD	H 450°F		-	-	-
B3	48 DC	48750	F 300°F		-	0.50	24
All Other	48 DC	1542	H 450°F		-	-	-
M	115 DC	115HD	H 450°F		-	0.26	30
B3	115 DC	115750	F 300°F		-	0.20	24
All Other	115 DC	1349	F 300°F		-	0.17	24
All Other	115 DC	1695	H 450°F		-	0.25	28
M	230 DC	230HD	H 450°F		-	-	-
B3	230 DC	23750	F 300°F		-	0.10	24
All Other	230 DC	1350	F 300°F		-	0.09	24
All Other	230 DC	1696	H 450°F		-	0.12	28

GOULD <-----> ASCO

CROSS REFERENCE FOR 2 - WAY SOLENOID VALVES

NORMALLY CLOSED
GOULD VALVES: Piston-Pilot Operated <-> ASCO VALVES: Both Piston-Pilot & Diaphragm

GOULD VALVE TYPE	AIR - WATER - GENERAL SERVICE			STAINLESS STEEL	
	BRONZE		K (303)	KX (316)	
1/8"	M-3V	Q-3V (to 2.50psi)	Q-3T (to 400psi)	N/A	N/A
1/4"	N/A	N/A	N/A	N/A	N/A
3/8"	N/A	N/A	N/A	N/A	N/A
1/2"	8210G1	8210G6	8210G6	*8210G36	N/A
	8210G2	8210G7	8210G7	*8210G37	N/A
3/4"	8210G9	8210G3	8210G3	*8210G88	N/A
1"	8210G4	*8210B27	*8210B27	*8210D89	N/A
1 1/4"	8210G8	8210G8	8210G8	N/A	N/A
1 1/2"	8210G22	8210G22	8210G22	N/A	N/A
2"	8210G100	8210G100	8210G100	N/A	N/A
2 1/2"	-- --	8210G101	8210G101	-- --	-- --
3"	-- --	8210B51	8210B51	-- --	-- --

GOULD VALVE TYPE	AIR - WATER - GENERAL SERVICE			STAINLESS STEEL (303)	
	BRONZE		Q-1-3T (to 200psi)	Q-1-3T (to 200psi)	K-1 (to 200psi)
1/8"	M-1-3EP (to 50psi)	M-1-3T (to 12.5psi)	N/A	N/A	N/A
1/4"	N/A	N/A	N/A	N/A	N/A
3/8"	8220G1	8220G19	N/A	N/A	N/A
1/2"	8220G3	8220G21	N/A	N/A	*8222C87
3/4"	8220G5	8220G23	8222G5	8222G5	*8222C88
1"	8220G7	8220G25	8222G9	8222B89	8222B89
1 1/4"	8220G9	8220G27	N/A	N/A	N/A
1 1/2"	8220G11	8220G29	N/A	N/A	N/A
2"	8220G13	8220G31	N/A	N/A	N/A
2 1/2"	-- --	8220G33	8220G33	8220G33	-- --
3"	-- --	N/A	N/A	N/A	-- --

*Denotes ASCO Diaphragm Valve [GOULD Valve requires 5 psi Minimum Pressure Differential]

NORMALLY CLOSED -- DIRECT ACTING

GOULD VALVE TYPE	AIR - WATER - GENERAL SERVICE			STAINLESS STEEL	
	BRONZE		K D	G & GST (303)	G X (316)
1/8"	B3-21	QD	F & FST	K D	G X
1/4"	-- --	-- --	8262G1	-- --	8262G12
3/8"	8262G202	-- --	8262G19	-- --	8262G80
1/2"	8263G2	8030G10	8263G2	8030G64	8263G330
3/4"	-- --	8030G16	-- --	8030G66	-- --
1"	-- --	8030G3	-- --	8030G63	-- --
	-- --	N/A	-- --	-- --	N/A

GOULD VALVE TYPE	AIR - WATER - GENERAL SERVICE			STAINLESS STEEL	
	BRONZE		Q-1-3T (to 200psi)	Q-1-3T (to 200psi)	K-1 (to 200psi)
1/8"	BH-19	F-1	N/A	N/A	N/A
1/4"	8263G58	N/A	N/A	N/A	N/A
3/8"	8263G300	N/A	N/A	N/A	N/A
1/2"	8263G305	N/A	8263G318	8263G318	N/A

--- -- This pipe size is not available
 N/A ASCO does not offer direct comparison

NOTES:

These comparisons are for Reference ONLY. Consult J.D. Gould Company for specific Solenoid Valve applications.
GOULD valve designations followed by "-2" and ASCO valve designations preceded by "EF" are NEMA 7

GOULD <-----> ASCO

CROSS REFERENCE FOR 2 - WAY SOLENOID VALVES

NORMALLY OPEN

GOULD VALVES: Piston-Pilot Operated & Direct Acting <-> ASCO VALVES: Piston-Pilot & Diaphragm

		AIR - WATER - GENERAL SERVICE						STEAM SERVICE			
GOULD VALVE TYPE	Bronze		304 Stainless Steel		316 Stainless Steel		Bronze		Stainless Steel		
	QR-3B (piston-pilot)	FR (direct acting)	GR (direct acting)	KR (piston-pilot)	GRX (direct acting)	KRX (piston-pilot)	QR-1-3T (piston-pilot)	FR-1 (direct acting)	GR-1 (direct acting)	KR-1 (piston-pilot)	
P 1/8"	N/A	8262G31 8262G91	8262G94 8262G35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P 1/4"	N/A	8262G260 to G265	8262G130 to G152	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
I 3/8"	*8210G33	N/A	N/A	N/A	N/A	N/A	822091	N/A	N/A	N/A	N/A
P 1/2"	*8210G34 8210G12	-- --	-- --	*8210G30	N/A	N/A	822093	-- --	-- --	N/A	N/A
E 3/4"	*8210G35 8210CL3	-- --	-- --	*8210G38	N/A	N/A	822095	-- --	-- --	N/A	N/A
I 1"	*8210B57 8210D14	-- --	-- --	N/A	N/A	N/A	822097	-- --	-- --	N/A	N/A
S 1 1/4"	*8210B58 8210D18	-- --	-- --	N/A	N/A	N/A	822099	-- --	-- --	N/A	N/A
I 1 1/2"	*8210B59 8210D32	-- --	-- --	N/A	N/A	N/A	8220101	-- --	-- --	N/A	N/A
Z 2"	8210103	-- --	-- --	N/A	N/A	N/A	8220103	-- --	-- --	N/A	N/A
E 2 1/2"	8210104	-- --	-- --	-- --	-- --	-- --	8220105	-- --	-- --	N/A	N/A
3"	N/A	-- --	-- --	-- --	-- --	-- --	N/A	-- --	-- --	N/A	N/A

*Denotes ASCO Diaphragm Valve [GOULD Valve requires 5 psi Minimum Pressure Differential]

LEGEND:

- -- Pipe Size not offered for particular GOULD VALVE type or ASCO cross-reference
- N/A ASCO does not offer a direct comparison to this GOULD VALVE

NOTES:

These comparisons are for Reference use ONLY. Consult J.D. Gould Company for specific Solenoid Valve Applications.

GOULD valve designations followed by "-2" and ASCO valve designations preceded by "EF" are NEMA 7

CROSS REFERENCE OF ATKOMATIC TO J D GOULD

CROSS REFERENCE FOR 2 - WAY SOLENOID VALVES

BRONZE NORMALLY CLOSED
GOULD VALVES: *Piston-Pilot Operated* <-> *ATKOMATIC VALVES: *Piston-Pilot Operated**

AIR - WATER - LT. OIL - GENERAL SERVICE

STEAM SERVICE

PIPE SIZE	SHORTY SERIES		M-3V SERIES	
	ATKOMATIC	CV	GOULD	CV
1/8"	N/A	N/A	M-3V	1.3
1/4"	JJ-200-Q	1.4	M-3V	2.1
3/8"	JJ-300-Q	2.7	M-3V	2.3
1/2"	JJ-400-Q	3.5	M-3V	3.9
3/4"	JJ-500-Q	7.5	M-3V	5.1
1"	JJ-600-Q	9.1	M-3V	11.6
1-1/4"	JJ-700-Q	19.5	M-3V	12.1
1-1/2"	JJ-800-Q	21	M-3V	26
2"	JJ-900-Q	46	M-3V	48

NOTE Use Type M4-3V for DC voltages & 12 or 24V 60 Hz.
Refer to Bulletin 120-M Series.

*** Required ordering information for J D Gould M-3V

*Pipe Size

*Pressure - Must specify (5-125 psi or 10-250 psi)

*Voltage

*** **NOTES:**

- 1 Contact Factory for optional features available for J D Gould valves.
- 2 J D Gould coils for above valves are rated NEMA 4X (Standard)
- 3 J D Gould above valves are UL & CSA listed for the following voltages, 120,240,480, 120/240(dual voltage) VAC,50/60hz. 26 Watts max.
- 4 Dual voltage coil (120/240,50/60) for ease of stock

PIPE SIZE	HOTSHOT SERIES		M-1-3T SERIES	
	ATKOMATIC	CV	GOULD	CV
1/8"	N/A	N/A	M-1-3T	1.3
1/4"	HS-200-Q	1.4	M-1-3T	2.1
3/8"	HS-300-Q	2.7	M-1-3T	2.3
1/2"	HS-400-Q	3.5	M-1-3T	3.9
3/4"	HS-500-Q	7.5	M-1-3T	5.1
1"	HS-600-Q	9.1	M-1-3T	11.6
1-1/4"	HS-700-Q	19.5	M-1-3T	12.1
1-1/2"	HS-800-Q	21	M-1-3T	26
2"	N/A	N/A	M-1-3T	48

NOTE Use Type M4-1-3T for DC voltages & 12 or 24V 60 Hz.
Refer to Bulletin 120-M Series.

*** Required ordering information for J D Gould M-1-3T

*Pipe Size

*Voltage

For 50 psi maximum, we recommend Type M-1-3EP.

10/11/2010

CROSS REFERENCE OF ATKOMATIC TO J D GOULD

GENERAL REFERENCE ONLY

Refer to specific bulletins and price list for details, Normally open styles, and Limitations

GOULD VALVES: Piston-Pilot Operated <- ATKOMATIC VALVES: Piston-Pilot Operated

BRONZE --- NORMALLY CLOSED

ATKOMATIC			
SERIES	GENERAL SERVICE / PSI	STEAM / PSI	SIZES
500	5-300	5-125	1/4" - 1-1/2"
4000	5-500	5-200	1/4" - 1-1/2"
5000	5-500	5-200	2" - 3"
6000	5-1500	5-200	1/4" - 1/2"
6000	5-1000	5-200	3/4" - 1-1/2"

J D GOULD			
TYPE	GENERAL SERVICE / PSI	STEAM / PSI	BULLETIN #
M	5-250	5-125	M-1-3T
Q	5-400	5-200	200-Q
A	5-1200	5-200	400-A
B	5-1200	5-200	600-B
D	5-1200	5-200	620-D

STAINLESS STEEL --- NORMALLY CLOSED

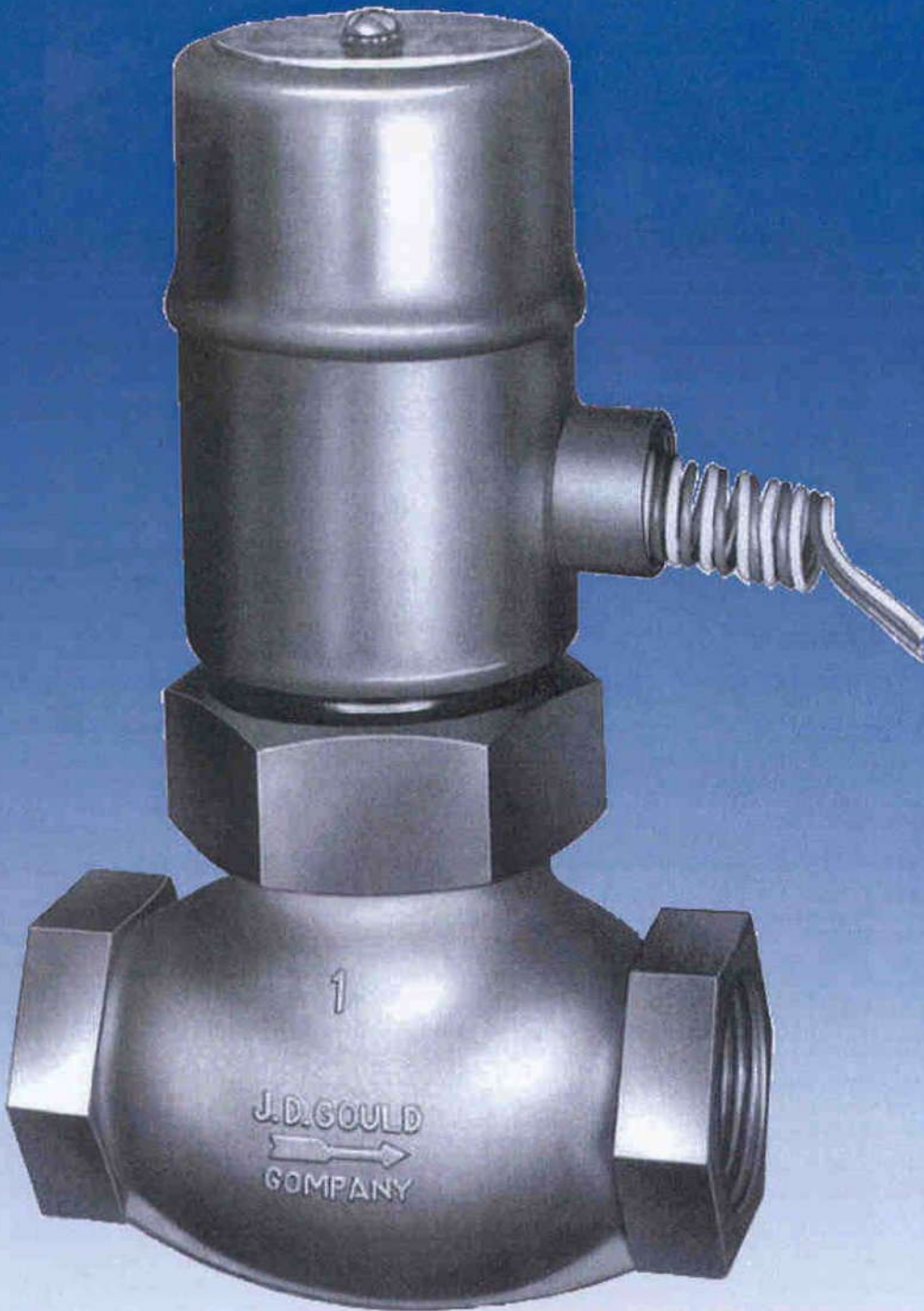
ATKOMATIC		
SERIES	GENERAL SERVICE / PSI	STEAM / PSI
8000	5-1500	5-300

J D GOULD		
TYPE	GENERAL SERVICE / PSI	STEAM / PSI
K	5-1000	5-200

- NOTE:**
1. Maximum air (gas) service of 400 psi on J D Gould valves. Liquids up to maximum as shown
 2. Consult Factory for cryogenic service
 3. Not available for fuel gases (natural gas, propane, etc)

10/11/2010

Bronze Construction



Solenoid Valves

J. D. Gould Company, Inc. www.mmcontrol.com/gouldvalve

Distributed By: M&M Control Service, Inc. phone: 800.876.0036 • fax: 847.356.0747

• e-mail: sales@mmcontrol.com

J.D. Gould Company, Inc.



SOLENOID VALVES

1/8"-2" NPT TYPE M & M-1 Series

2-WAY - CAST BRONZE BODIES - PACKLESS
VELVETROL® INTERNAL PISTON PILOT OPERATED
GENERAL PURPOSE SOLENOID VALVES
NORMALLY CLOSED WHEN DE-ENERGIZED



- ★ FOR: GENERAL SERVICE-AIR-WATER-LIGHT OIL-STEAM (M-3V* LEAKPROOF)
- ★ PRESSURES: 5 PSI MINIMUM TO 250 PSI (125 PSI FOR STEAM) MAXIMUM • FULL PORT
- ★ TEMPERATURE: -40°F TO 356°F. CLASS H COILS
- ★ MOUNTING: INSTALL IN HORIZONTAL LINE WITH COIL UPRIGHT AND ON TOP

SIZES 1/8" - 2" NPT FULL PORT	
★ SERVICE RATINGS	Complete Pricing, Service & Electrical Ratings are shown on the List Price Schedule. Valves will be furnished for 5-125 PSI and 120 VAC Unless Otherwise Specified.
--- NORMALLY CLOSED ONLY ---	
M-3B, M-3EP, M-3V 	GENERAL PURPOSE - AIR - WATER 5-125, 10-250 PSI; 220°F. Max. Fluid, Class H 120, 240, 480, 120/240 VAC (50/60 Hz), 26 Watts Max.
M4-3B M4-3EP M4-3V	GENERAL PURPOSE - AIR - WATER - INERT GASES SELECTED LIQUIDS (Consult Factory) 5-125, 10-250 PSI; 250°F. Max. Fluid, Class H 24,120, 240, 480, 120/240 VAC (50/60 Hz), 26 Watts Max. 12, 24, 48, 115, 230 VDC, 24 Watts Max.
M-1-3T, M-1-3EP 	STEAM - HOT FLUIDS 5-125 PSI; 356°F (-3EP is 5-50 PSI; 300°F) Max. Fluid, Class H 120, 240, 480 VAC (50/60 Hz), 26 Watts Max.
M4-1-3T, M4-1-3EP	STEAM - HOT FLUIDS 5-125 PSI (-3EP is 5-50 PSI) SELECTED LIQUIDS (Consult Factory) 5-125, 10-250 PSI; 356°F (-3EP is 300°F) Max. Fluid, Class H 24,120, 240, 480, 120/240 VAC (50/60 Hz), 26 Watts Max. 12, 24, 48, 115, 230 VDC, 24 Watts Max.

★ **CONSTRUCTION:**

CLASS H COILS are **NEMA 4X**, Fungus proof, Molded of Filled Polyester with 18" Leads and 1/2" Conduit Connector
BODIES are rated to 400 psi and Cast in Bronze.
PLUNGER TUBES are Stainless Steel silver soldered to the Brass BONNET.
PISTON ASSEMBLIES are Brass with Filled Teflon® PISTON RINGS, Stainless Steel EXPANDERS, and Buna, EP, and Fluorocarbon SEAT DISCS.
PILOT VALVES & SPRINGS are Stainless Steel.

★ **SPECIALS:**

Teflon® Leak Proof Seat Screws, Teflon® Discs (Standard on all Steam Valves), Teflon® Coated Pistons & other Special Assemblies Available. Non-Standard Coils Available with Voltage, Wattage, and Lead Wire Length to your specifications.

See Price Schedule for "Terms and Conditions of Sale"
See the List Price Schedule for UL and CSA Listings.

* Also -3B, and -3EP

PERFORMANCE, ORDERING AND INSTALLATION GUIDE

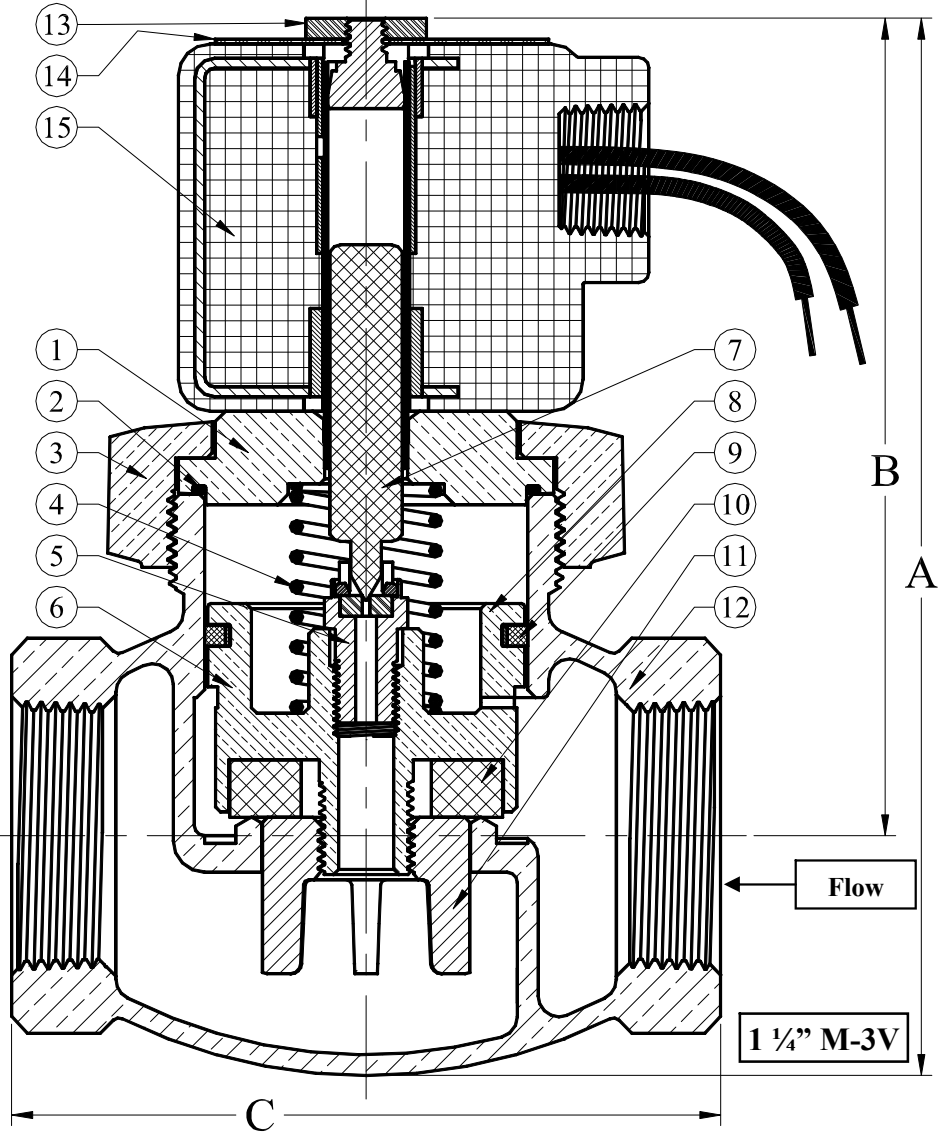
ORDERING DATA--SPECIFY PIPE SIZE, TYPE, FLUID, OPERATING PRESSURE, TEMPERATURE RANGE, ELECTRICAL SPECIFICATIONS, BACKPRESSURE, (IF ANY).

FLOW CHARACTERISTICS--SEE FLOW CURVES IN BULLETIN 5-FL, OR Cv FACTORS LISTED BELOW AND IN BULLETIN CP-1.

OPERATION--PISTON PILOT OPERATED. MINIMUM PRESSURE DROP OF 5 PSI (ΔP) IS REQUIRED ACROSS VALVE FOR OPERATION.

MOUNTING--MOUNT IN HORIZONTAL LINE WITH COIL VERTICAL AND ON TOP. INSTALL 40 MESH STRAINER (NOT LARGER) AHEAD OF VALVE. CHECK FOR PROPER COIL VOLTAGE. MAKE SURE THAT THE FLOW ARROW ON VALVE BODY IS POINTING IN THE DIRECTION OF FLOW.

SERVICING--SOLENOID VALVES SHOULD BE FREQUENTLY CHECKED FOR OPERATION, CLEANLINESS, & INTERNAL WEAR - REPAIR KITS ARE FACTORY AVAILABLE --GIVE SIZE, TYPE, SERIAL NUMBER OR OPERATING DATA VOLTAGE, PRESSURE, ETC.)



* Also -3B, and -3EP

Physical Dimensions					
Size	Cv	Weight	A	B	C
1/8"	1.3	3 lbs	5.13	4.25	2.75
1/4"	2.1	3 lbs	5.13	4.25	2.75
3/8"	2.3	3 lbs	5.13	4.25	2.75
1/2"	3.9	3 lbs	5.13	4.25	2.75
3/4"	5.1	4 lbs	5.50	4.50	3.25
1"	11.6	5 lbs	5.75	4.56	3.81
1 1/4"	12.1	7 lbs	6.50	5.06	4.25
1 1/2"	26	9 lbs	7.06	5.38	4.88
2"	48	14 lbs	8.00	5.88	5.88

	1	2	2	3	4	5	5	6	6	7	7	8	9	10	10	11	12	13	14	15
Size	Bonnet Assembly	M-3V [*] Bonnet O-Ring	M-1-3T Bonnet O-Ring	Bonnet Ring	Piston Spring	M-3V [*] Seat Screw	M-1-3T Seat Screw	M-3V [*] Piston Assembly	M-1-3T Piston Assembly	M-3V [*] Pilot Valve	M-1-3T Pilot Valve	Piston Only	Piston Ring Expander	M-3V [*] Seat Disc	M-1-3T Seat Disc	Guide Nut	Body	Coil Nut	Name Plate	Coil
1/8"	403-1	2-121	2-121V	N/A	37-14	415-31V	415-31T	407-3V	407-T-3T	486NP	486	402	57	36-12	36-12T	406	400-8	6-15	44-1	Consult Factory
1/4"	403-1	2-121	2-121V	N/A	37-14	415-31V	415-31T	407-3V	407-T-3T	486NP	486	402	57	36-12	36-12T	406	400-4	6-15	44-1	
3/8"	403-1	2-121	2-121V	N/A	37-14	415-31V	415-31T	407-3V	407-T-3T	486NP	486	402	57	36-12	36-12T	406	400-1	6-15	44-1	
1/2"	403-1	2-121	2-121V	N/A	37-14	415-31V	415-31T	407-3V	407-T-3T	486NP	486	402	57	36-12	36-12T	406	400-2	6-15	44-1	OR List Price Schedule
3/4"	413-1	2-125	2-125V	N/A	37-3	415-3V	415-3T	417-3V	417-T-3T	486NP	486	412	159	36-34	36-34T	416	410	6-15	44-1	
1"	423-1	N/A	N/A	428	37-3	415-31V	415-31T	427-3V	427-T-3T	486NP	486	422	58	36-1	36-1T	429	420	6-15	44-1	
1 1/4"	433-1	N/A	N/A	438	37-2	415-31V	415-31T	437-3V	437-T-3T	486NP	486	432	434	36-114	36-114T	439	430	6-15	44-1	
1 1/2"	443-1	N/A	N/A	448	37-2	415-31V	415-31T	447-3V	447-T-3T	486NP	486	442	93	36-112	36-112T	449	440	6-15	44-1	
2"	453-1	2-40	2-40V	458	37-2	415-31V	415-31T	457-3V	457-T-3T	486NP	486	452	176	36-2	36-2T	459	450	6-15	44-1	



SOLENOID VALVES

1/8"-3" NPT TYPE Q & QR Series

2-WAY – CAST BRONZE BODIES - PACKLESS
VELVETROL® INTERNAL PISTON PILOT OPERATED
GENERAL PURPOSE SOLENOID VALVES - FULL PORT
NORMALLY CLOSED OR NORMALLY OPEN



- ★ FOR: GENERAL SERVICE-AIR-INERT GASES-WATER-OIL-STEAM
- ★ PRESSURES: 5 PSI DIFFERENTIAL MINIMUM TO 400 PSI MAXIMUM
- ★ TEMPERATURE: -40°F TO 450°F. CLASS F OR H COILS
- ★ MOUNTING: INSTALL IN HORIZONTAL LINE WITH COIL UPRIGHT AND ON TOP

SIZES 1/8" - 3" NPT FULL PORT		
★ SERVICE RATINGS	Complete Pricing, Service & Electrical Ratings shown in Price Schedule. Valves will be furnished for 5-150 PSI Air-Water and 120 VAC Unless Otherwise Specified.	
NORMALLY CLOSED--		--NORMALLY OPEN
Q-3B, Q-3EP, Q-3V  Q-3T	GENERAL PURPOSE – AIR – WATER 5-150, 10-400 PSI (Normally Open to 300 PSI) 220°F. Max. Fluid Temp. Class F Coils: 120, 240, 480 VAC 60 Hz, 14Watts Max.	QR-3B, QR-3EP QR-3V, QR-3T
Q4-3B, Q4-3EP Q4-3V, Q4-3T	GENERAL PURPOSE: AIR – WATER - INERT GASES – WATER – OIL 5-150, 10-400 PSI (Normally Open to 300 PSI) 300°F. Max. Fluid Temp. Class F. Non-Standard Coils Available With Voltage, Wattage, and Lead Wire Length To Your Specs.	QR-3B, QR-3EP QR-3V, QR-3T
Q-1-3T, Q-1-3EP 	STEAM 5-150 PSI; 365°F Max. Fluid Temp., (-3EP: 5-50, 300°F); Class H 120, 240, 480 VAC 60 Hz, 20 Watts Max.	QR-1-3T QR-1-3EP
Q4-1-3T, Q4-1-3EP	STEAM (to 200 PSI) – HOT FLUIDS (to 450°F) SIMILAR TO Q4 Series EXCEPT High Temp.	QR-1-3T, QR-1-3EP
ADD -1	HIGH TEMP. (CLASS H) COILS - FLUID TEMP. TO 450°F. STEAM to 200 PSI.	ADD -1
ADD -2	EXPLOSION PROOF COIL HOUSING – UL CLASS I GROUP D, CLASS II GROUP E, F, G. NEMA 7	ADD -2
ADD -3B, -3EP -3T, -3V	LEAKPROOF PILOT SEAT: -3B (BUNA), -3EP ETHYLENE- PROPYLENE, -3T (TEFLON®) PTFE, -3V (VITON®) FLUOROCARBON	ADD -3B, -3EP -3T, -3V
ADD -24	WATER TIGHT COIL HOUSING - NEMA 4	ADD -24
ADD -25	DUST TIGHT COIL HOUSING - NEMA 5	ADD -25
ADD -57	MANUAL RESET – SAFETY SHUT-OFF, NO VOLTAGE RELEASE. SEE BULLETIN 210-Q57	ADD -57
ADD -81, -84	-81 SLOW CLOSE (REDUCES WATER HAMMER) -84 QUICK CLOSE (BOTH FACTORY SETUPS)	ADD -81, 84
ADD -230	SPECIAL CONSTRUCTION FOR GASOLINE AND DIESEL FUEL. SEE BULLETIN 230-Q	ADD -230

★ **CONSTRUCTION:**

CLASS F & H COILS are Waterproof, Fungusproof, Molded of Filled Polyester with 18" Leads.
 BODIES are Sand Cast in Bronze rated 400 psi WOG. PISTON SPRINGS are 316 or 302 SS.
 BONNET ASSEMBLIES are 304 SS TUBES silver soldered to Brass BONNET and TUBE PLUG.
 PISTON ASSEMBLIES are Brass with Filled Teflon® PISTON RINGS, Stainless Steel EXPANDERS, and Buna, EP,
 Fluorocarbon, or Virgin Teflon® SEAT DISCS.
 PILOT ASSEMBLIES are 416 SS ARMATURE with a 316 SS PILOT POINT and 316 SS PINS.

★ **SPECIALS:**

Teflon® Leak Proof Seat Screws, Teflon® Discs (Standard on all Steam Valves), Teflon® Coated Pistons & other Special Assemblies Available. Non-Standard Coils are Available with Voltage, Wattage, and Lead Wire Length to your specifications. Consult Factory.

See Price Schedule for "Terms and Conditions of Sale."

PERFORMANCE, ORDERING AND INSTALLATION GUIDE

ORDERING DATA--SPECIFY PIPE SIZE, TYPE, FLUID, OPERATING PRESSURE, TEMPERATURE RANGE, ELECTRICAL SPECIFICATIONS, BACK PRESSURE (IF ANY).

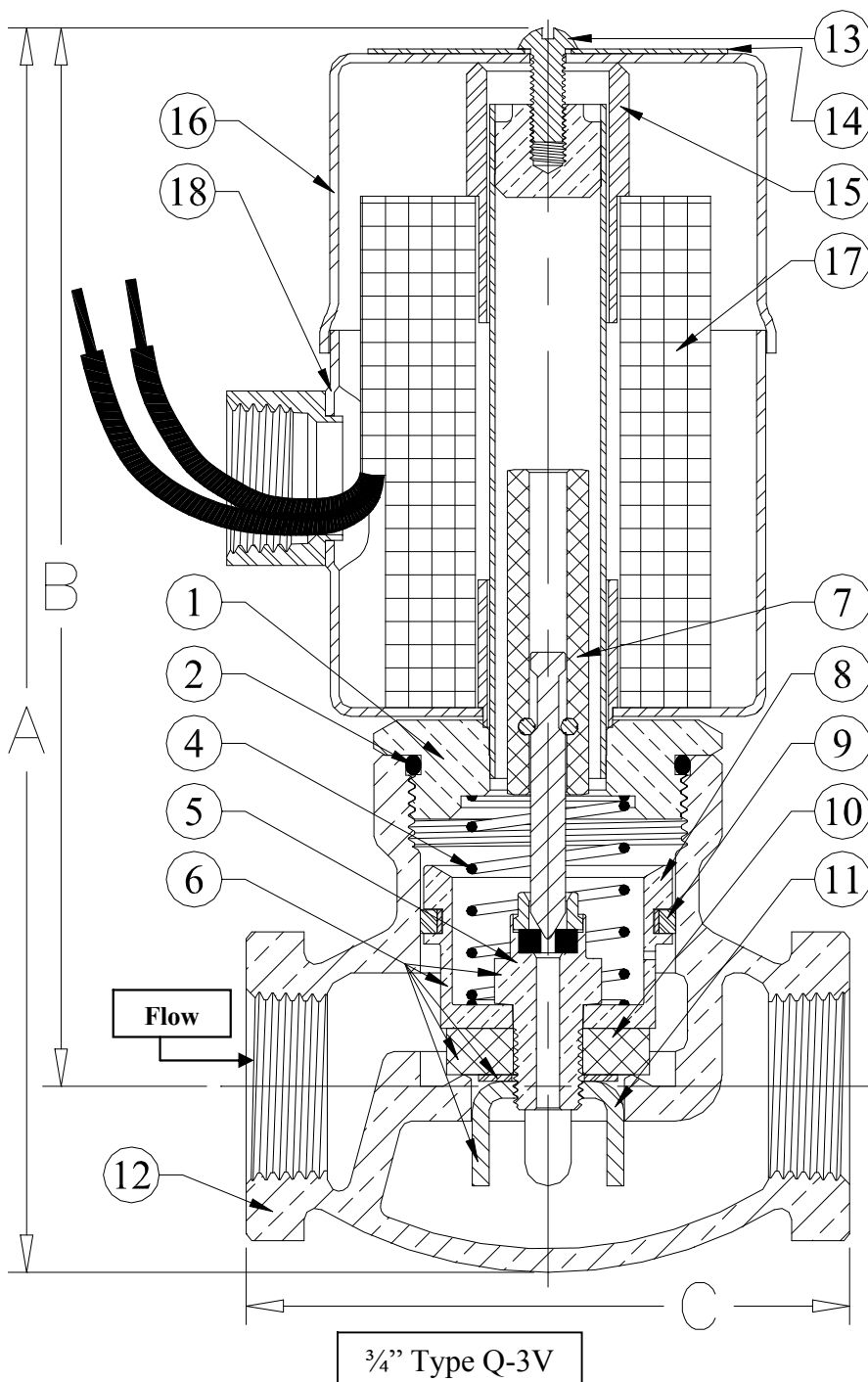
FLOW CHARACTERISTICS--SEE FLOW CURVES IN BULLETIN 5-FL, OR Cv FACTORS LISTED BELOW AND IN BULLETIN CP-1.

OPERATION--PISTON PILOT OPERATED. MINIMUM PRESSURE DROP OF 5 PSI (ΔP) IS REQUIRED ACROSS VALVE FOR OPERATION.

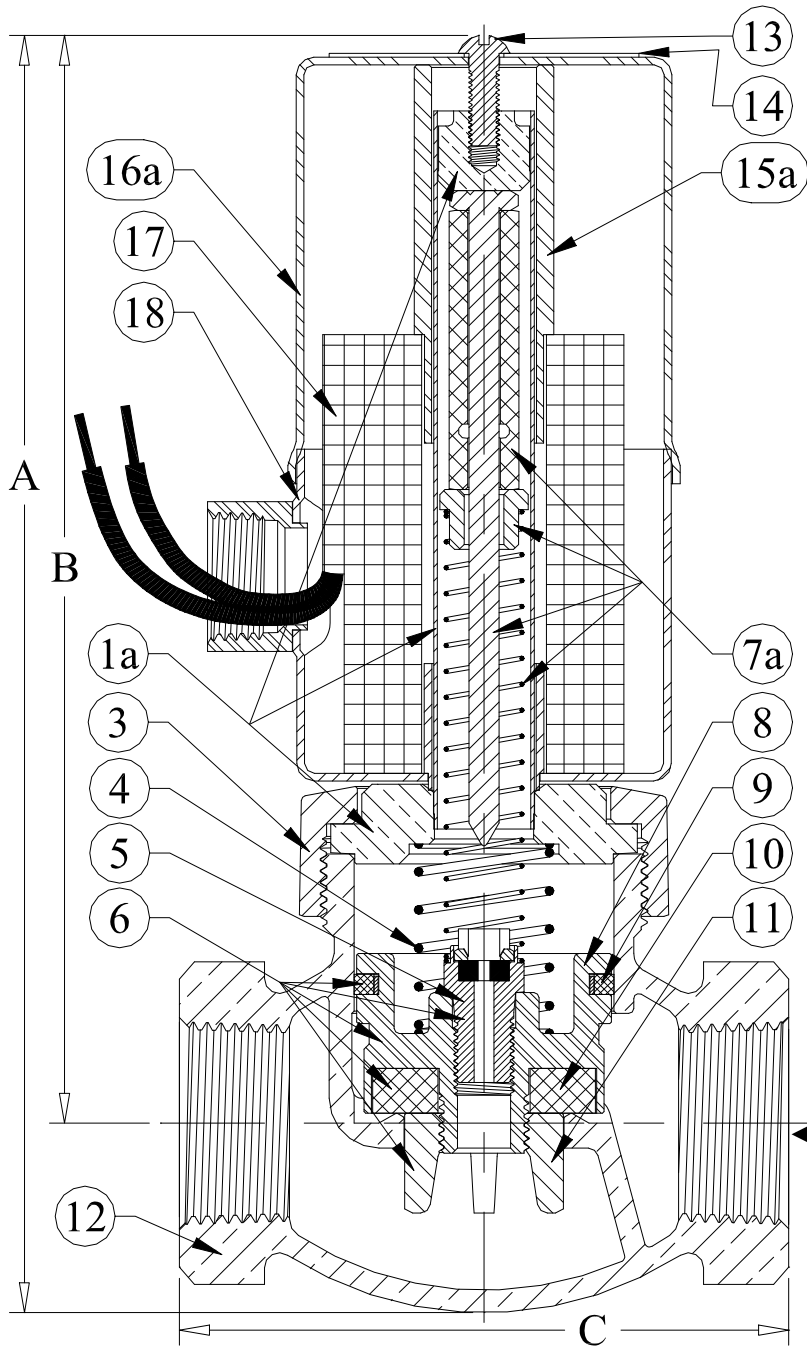
MOUNTING--MOUNT IN HORIZONTAL LINE WITH COIL VERTICAL AND ON TOP. INSTALL 40 MESH STRAINER (NO LARGER) AHEAD OF VALVE. CHECK FOR PROPER COIL VOLTAGE. MAKE SURE THAT THE FLOW ARROW ON VALVE BODY IS POINTING IN THE DIRECTION OF FLOW. PTFE TAPE STRONGLY RECOMMENDED FOR ALL JOINTS.

OPERATING PRESSURE: THE SOLENOID VALVE SHOULD BE ORDERED WITH **THE MAXIMUM RATED PRESSURE CLOSEST TO THE ACTUAL PRESSURE THE VALVE WILL OPERATE IN.** FOR EXAMPLE: IF YOUR APPLICATION IS FOR 40 PSI, ORDER A VALVE RATED 5-150 PSI **NOT** 10- 400 PSI.

SERVICING--SOLENOID VALVES SHOULD BE FREQUENTLY CHECKED FOR OPERATION, CLEANLINESS, & INTERNAL WEAR - REPAIR KITS ARE FACTORY AVAILABLE --GIVE SIZE, TYPE, SERIAL NUMBER OR OPERATING DATA (VOLTAGE, PRESSURE, ETC.)



Valve Size	1	1a	2	3	4	5	6	7	7a	8	9	10	11	12	13	14
	N.C. Bonnet Assembly	N.O. Bonnet Assembly	Bonnet Seal	Bonnet Ring	Piston Spring	SeatScrew	Piston Assembly	N.C. Pilot Assembly	N.O. Pilot Assembly	Piston Only	Piston Ring & Expander	Seat Disc	Guide Nut	Body	Coil Screw	Nameplate
	Q-3V*	QR-3V*	BOTH	BOTH	BOTH	BOTH	BOTH	Q-3V*	QR-3V*	BOTH	BOTH	BOTH	BOTH	BOTH	BOTH	BOTH
1/8	403-2	403-2R	2-121x	N/A	37-14	415-3x	407-3x	25-1	32R1	402	57	36-12x	406	400-8	9	44-1-1
1/4	403-2	403-2R	2-121x	N/A	37-14	415-3x	407-3x	25-1	32R1	402	57	36-12x	406	400-4	9	44-1-1
3/8	403-2	403-2R	2-121x	N/A	37-14	415-3x	407-3x	25-1	32R1	402	57	36-12x	406	400-1	9	44-1-1
1/2	403-2	403-2R	2-121x	N/A	37-14	415-3x	407-3x	25-1	32R1	402	57	36-12x	406	400-2	9	44-1-1
3/4	413-2	413-2R	2-125x	N/A	37-3	415-3x	417-3x	25-1	32R1	412	159	36-34x	416	410	9	44-1-1
1	423-2	423-2R	N/A	428	37-3	415-3x	427-3x	25-1	32R1	422	58	36-1x	429	420	9	44-1-1
1-1/4	433-2	433-2R	N/A	438	37-2	415-3x	437-3x	25-1	32R1	432	434	36-114x	439	430	9	44-1-1
1-1/2	443-2	443-2R	N/A	448	37-2	415-3x	447-3x	25-1	32R1	442	93	36-112x	449	440	9	44-1-1
2	453-2	453-2R	2-40x	458	37-2	415-3x	457-3x	25-1	32R1	452	176	36-2x	459	450	9	44-1-1
2-1/2	463-2	463-2R	2-42x	468	37-2	415-3x	467-3x	22-1	32R6	462	102	36-212x	469	460	9	44-1-1
3	473-2	473-2R	2-46x	478	37-2	415-3x	477-3x	22-1	32R6	472	474	36-3x	479	470	9	44-1-1



Valve Size	15	15a	16	16a	17	18
	N.C. Nip	N.O. Nip	N.C. Coil Cover	N.O. Coil Cover	Coil	Coil Can
	Q-3V*	QR-3V*	Q-3V*	QR-3V*	BOTH	BOTH
1/8	115-2	115-3	89	89NO	Consult Factory or List Price Schedule	87
1/4	115-2	115-3	89	89NO		87
3/8	115-2	115-3	89	89NO		87
1/2	115-2	115-3	89	89NO		87
3/4	115-2	115-3	89	89NO		87
1	115-2	115-3	89	89NO		87
1-1/4	115-2	115-3	89	89NO		87
1-1/2	115-2	115-3	89	89NO		87
2	115-2	115-3	89	89NO		87
2-1/2	115-2	115-3	89	89NO		87
3	115-2	115-3	89	89NO	87	

Valve Size	CV Factor	Valve Dimensions							
		N. C.				N. O.			
		A	B	C	wt lbs	A	B	C	wt lbs
1/8	1.3	6.31	5.5	2.75	3	7.31	6.5	2.75	4
1/4	2.1	6.31	5.5	2.75	3	7.31	6.5	2.75	4
3/8	2.3	6.31	5.5	2.75	3	7.31	6.5	2.75	4
1/2	3.9	6.31	5.5	2.75	3	7.31	6.5	2.75	4
3/4	5.1	6.69	5.7	3.25	4	7.69	6.7	3.25	4
1	11.6	7.0	5.83	3.81	5	8.0	6.83	3.81	5
1-1/4	12.1	7.7	6.3	4.25	6	8.7	7.3	4.25	7
1-1/2	26	8.27	6.64	4.88	8	9.27	7.64	4.88	9
2	48	8.88	6.94	5.88	13	9.88	7.94	5.88	14
2-1/2	75	9.63	7.3	7.00	18	10.63	8.3	7.00	18
3	100	10.6	7.8	8.25	27	11.6	8.8	8.25	27

* Also for -3B, -3EP, & -3T Valves

FLOW

1 inch Type QR-3V

Valve Size	1b N.C. XP Bonnet Assembly	1c N.O. XP Bonnet Assembly	7b N.C. XP Pilot Assembly	7c N.O. XP Pilot Assembly	20 Coil Endplates	21 Coil Spring	22 N.C. XP Cover	N.O. XP Cover	23 XP Bolts	XP Washers	24 XP Base
	Q-3V-2*	QR-3V-2*	Q-3V-2*	QR-3V-2*	Q-3V-2* QR-3V-2*	Q-3V-2* QR-3V-2*	Q-3V-2*	QR-3V-2*	Q-3V-2* QR-3V-2*	Q-3V-2* QR-3V-2*	Q-3V-2* QR-3V-2*
1/8	403-2XP	403-2RXP	22-1	32R-6	113	37-2	42NC	42NO	9-4	46-3	41A
1/4	403-2XP	403-2RXP	22-1	32R-6	113	37-2	42NC	42NO	9-4	46-3	41A
3/8	403-2XP	403-2RXP	22-1	32R-6	113	37-2	42NC	42NO	9-4	46-3	41A
1/2	403-2XP	403-2RXP	22-1	32R-6	113	37-2	42NC	42NO	9-4	46-3	41A
3/4	413-2XP	413-2RXP	22-1	32R-6	113	37-2	42NC	42NO	9-4	46-3	41A
1	423-2XP	423-2RXP	22-1	32R-6	113	37-2	42NC	42NO	9-4	46-3	41A
1-1/4	433-2XP	433-2RXP	22-1	32R-6	113	37-2	42NC	42NO	9-4	46-3	41A
1-1/2	443-2XP	443-2RXP	22-1	32R-6	113	37-2	42NC	42NO	9-4	46-3	41A
2	453-2XP	453-2RXP	22-1	32R-6	113	37-2	42NC	42NO	9-4	46-3	41A
2-1/2	463-2XP	463-2RXP	24-1	32R-7	113	37-2	42NC	42NO	9-4	46-3	41A
3	473-2XP	473-2RXP	24-1	32R-7	113	37-2	42NC	42NO	9-4	46-3	41A

size	A	B	C	wt
1/8	7	6.19	2.75	7
1/4	7	6.19	2.75	7
3/8	7	6.19	2.75	7
1/2	7	6.19	2.75	7
3/4	7.38	6.38	3.25	8
1	7.63	6.44	3.81	9
1-1/4	8.38	6.88	4.25	10
1-1/2	8.88	7.25	4.88	12
2	9.81	7.69	5.88	17
2-1/2	10.13	8.25	7	22
3	11.19	8.38	8.25	31

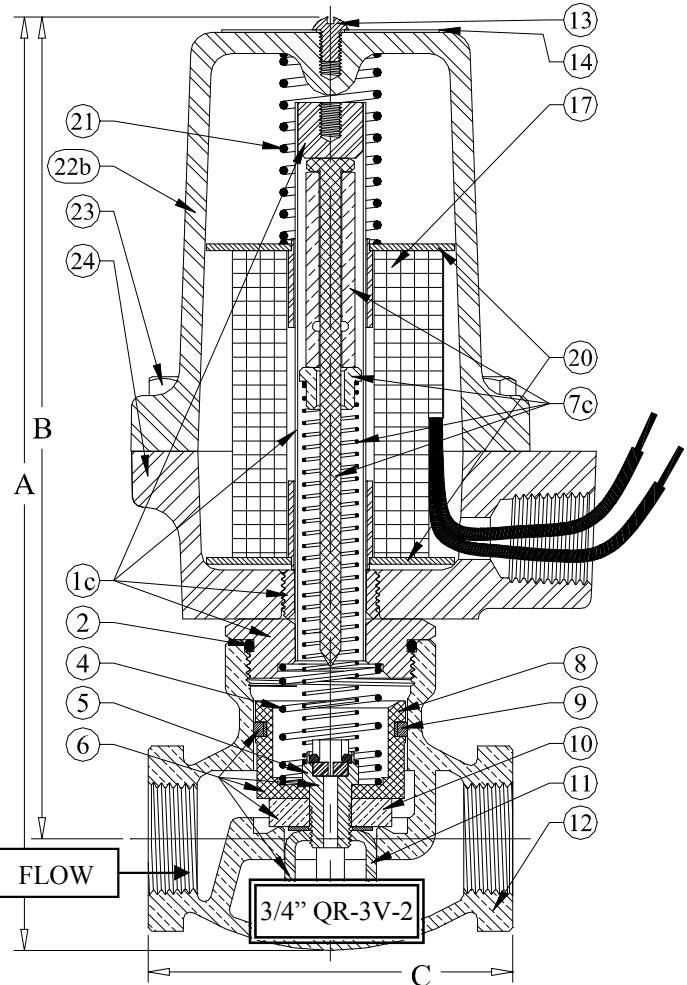
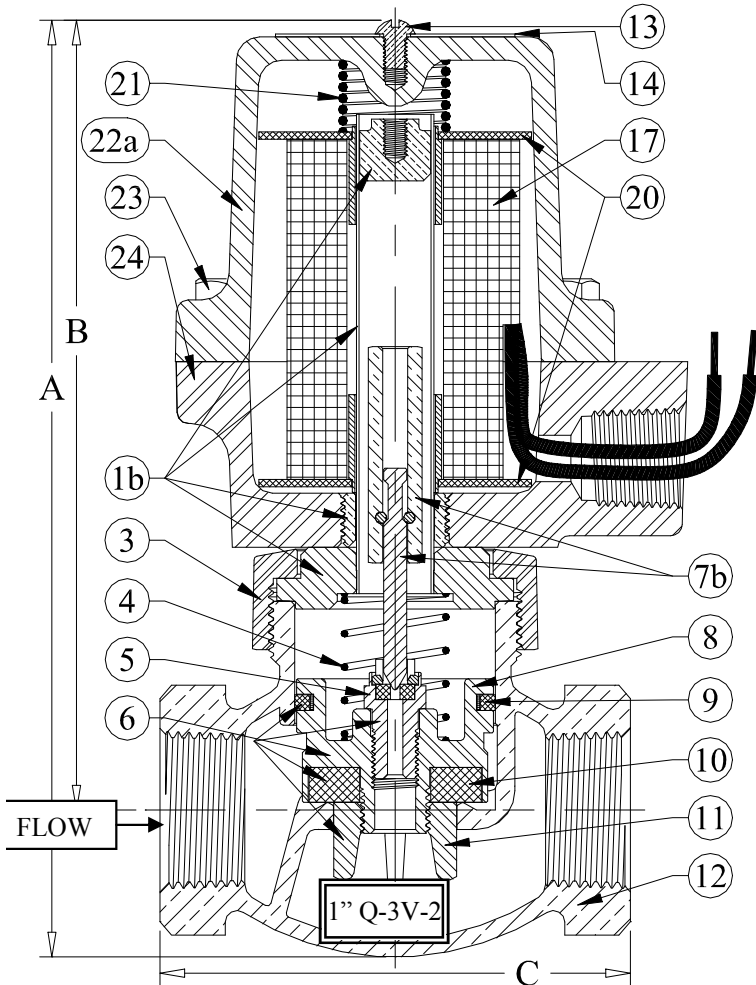
Physical Dimensions of Normally Closed Valves

The Explosionproof housing is constructed of two (2) machined, enamel painted sand-cast gray iron parts bolted together, threaded onto the bonnet assembly and rigidly cemented in place. Once assembled the housing will *not* rotate. NEMA 4, NEMA 5, or NEMA 7 ratings are available with this housing.

size	A	B	C	wt
1/8	8.13	7.31	2.75	8
1/4	8.13	7.31	2.75	8
3/8	8.13	7.31	2.75	8
1/2	8.13	7.31	2.75	8
3/4	8.50	7.50	3.25	9
1	8.75	7.56	3.81	10
1-1/4	9.50	8.00	4.25	11
1-1/2	10.00	8.38	4.88	13
2	10.94	8.81	5.88	18
2-1/2	11.25	9.38	7	22
3	12.31	9.50	8.25	31

Physical Dimensions of Normally Open Valves

* Also for -3B, -3EP, & -3T Valves



SOLENOID VALVES

**1/8"-3" NPT
TYPES Q-230
& QR-230**

2-WAY – CAST BRONZE BODIES - PACKLESS
VELVETROL® INTERNAL PISTON PILOT OPERATED
SAFETY SOLENOID VALVES FOR HAZARDOUS LOCATIONS
NORMALLY CLOSED OR NORMALLY OPEN - FULL PORT
PETROLEUM BASED FLUIDS



- ★ FOR: CLASS1, GROUP D FOR GASOLINE, DIESEL FUEL, #1 AND #2 FUEL OIL
- ★ PRESSURES: 5 PSI DIFFERENTIAL MINIMUM TO 150 PSI MAXIMUM
- ★ TEMPERATURE: 77°F. MAX. AMBIENT TEMP. CLASS F, 220°F MAX FLUID
- ★ MOUNTING: INSTALL IN HORIZONTAL LINE WITH COIL UPRIGHT AND ON TOP

SIZES 1/8" - 3" NPT FULL PORT		
★ SERVICE RATINGS	Complete Pricing, Service & Electrical Ratings shown in the List Price Schedule. Valves will be furnished for 5-100 PSI and 120 VAC Unless Otherwise Specified.	
NORMALLY CLOSED--		--NORMALLY OPEN
TYPE Q-230 (Up to 2")	5-100 PSI, 77°F. Max. Fluid, 77°F. Max. Ambient, Class F 120, 240, 480 VAC 60 Hz, 14 Watts Max.	N/A
TYPE Q4-230	5-150 PSI, 300°F. Max. Fluid, Class F 12, 24, 120, 240, 480 VAC 60 Hz 6, 12, 24, 48, 115, 230 VDC	TYPE QR-230
ADD -81, -84	-81 SLOW CLOSE (REDUCES WATER HAMMER) -84 QUICK CLOSE (BOTH FACTORY SETUPS)	ADD -81, -84

- ★ **CONSTRUCTION:**
CLASS F COILS are Waterproof, Fungusproof, Molded of Filled Polyester with 18" Leads, inside an Enamel Painted Cast Iron NEMA 7 COIL HOUSING with a 1/2" NPT Conduit Connector.
BODIES are Globe Style with Union Bonnets, rated to 400 psi, Cast in Bronze. PISTON SPRINGS are Stainless Steel.
BONNET ASSEMBLIES are 304 SS TUBES, Brass BONNETS, and Brass TUBE PLUGS silver soldered together.
PISTON ASSEMBLIES are Brass with Filled PTFE PISTON RINGS and SS EXPANDERS.
SEAT DISCS and PILOT DISC are Fluorocarbon.
PILOT ASSEMBLIES are 416 SS ARMATURE with a 316 SS PILOT POINT and 316 SS PINS.

See List Price Schedule for "Terms and Conditions of Sale"

PERFORMANCE, ORDERING AND INSTALLATION GUIDE

ORDERING DATA--SPECIFY PIPE SIZE, TYPE, FLUID, OPERATING PRESSURE, TEMPERATURE RANGE, ELECTRICAL SPECIFICATIONS, BACK PRESSURE (IF ANY).

FLOW CHARACTERISTICS--SEE FLOW CURVES IN BULLETIN 5-FL, OR Cv FACTORS LISTED BELOW AND IN BULLETIN CP-1.

OPERATION--PISTON PILOT OPERATED. MINIMUM PRESSURE DROP OF 5 PSI (ΔP) IS REQUIRED ACROSS VALVE FOR OPERATION.

MOUNTING--MOUNT IN HORIZONTAL LINE WITH COIL VERTICAL AND ON TOP. INSTALL 40 MESH STRAINER (NOT LARGER) AHEAD OF VALVE. CHECK FOR PROPER COIL VOLTAGE. MAKE SURE THAT THE FLOW ARROW ON VALVE BODY IS POINTING IN THE DIRECTION OF FLOW.

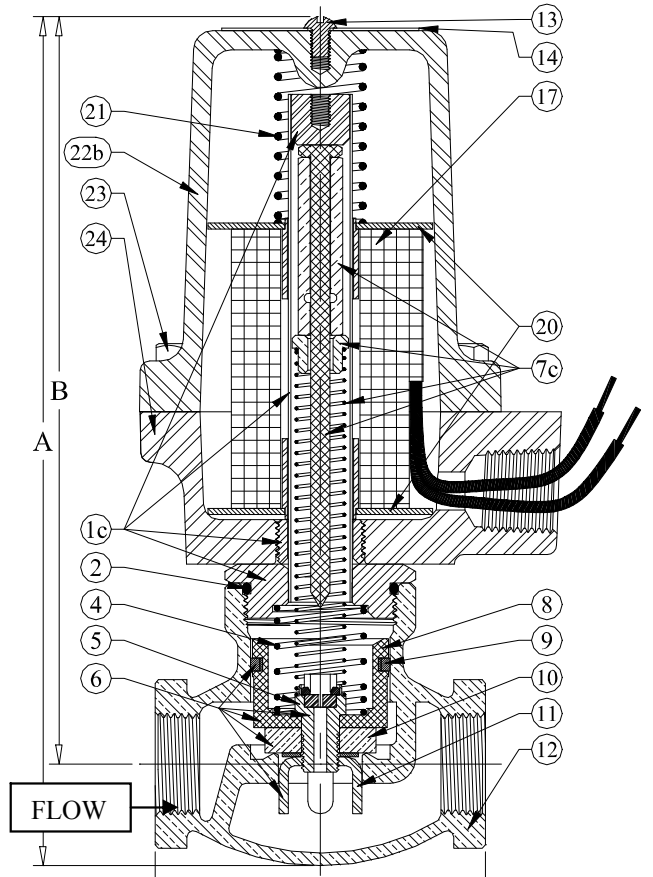
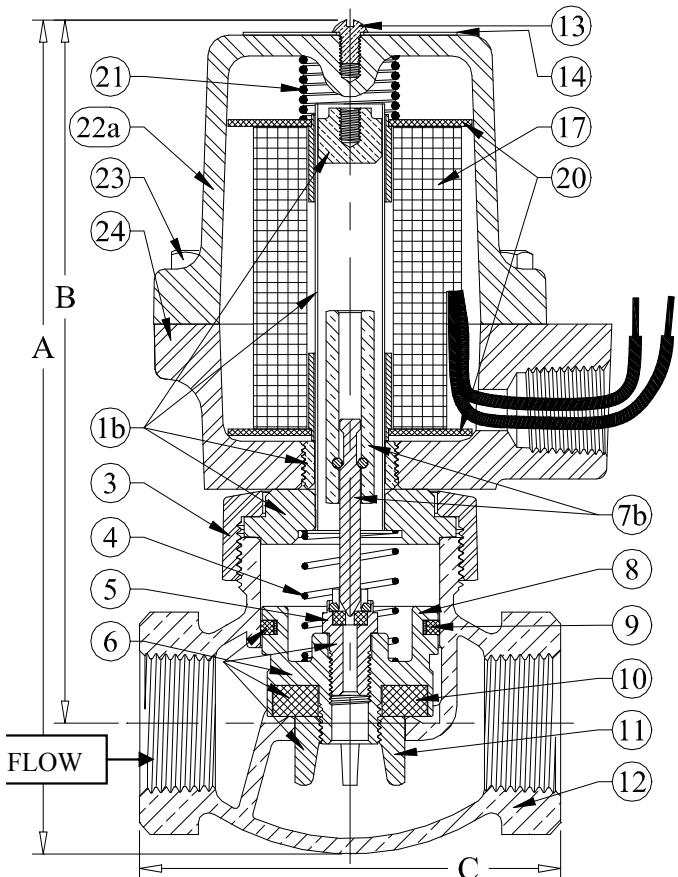
SERVICING--SOLENOID VALVES SHOULD BE FREQUENTLY CHECKED FOR OPERATION, CLEANLINESS, & INTERNAL WEAR - REPAIR KITS ARE FACTORY AVAILABLE --GIVE SIZE, TYPE, SERIAL NUMBER OR OPERATING DATA (VOLTAGE, PRESSURE, ETC.)

Valve Size	1a	1b	2	3	4	5	6a	6b	7	8	9	10	11	12	13	14	15	16	17
	N. C. Bonnet Assembly	N. O. Bonnet Assembly	Bonnet Ring	Piston Spring	Seat Screw	Piston Assembly	N.C. Pilot Assembly	N. O. Pilot Assembly	Piston Only	Piston Ring & Expander	Seat Disc	Guide Nut	Body	Coil Screw	Nameplate	Coil	Bonnet Seal	Coil Endplates	Coil Spring
	Q230	QR230	ALL	ALL	ALL	ALL	Q230	QR-230	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	Q230	QR230
1/8	4032XP	4032RXP	N/A	37-14	415-31V	4073VV	22-1	32R-6	402	57	36-12V	406	400-8	9	4434	Consult Factory or the List Price Schedule	2-121V	113	37-2
1/4	4032XP	4032RXP	N/A	37-14	415-31V	4073VV	22-1	32R-6	402	57	36-12V	406	400-4	9	4434		2-121V	113	37-2
3/8	4032XP	4032RXP	N/A	37-14	415-31V	4073VV	22-1	32R-6	402	57	36-12V	406	400-1	9	4434		2-121V	113	37-2
1/2	4032XP	4032RXP	N/A	37-14	415-31V	4073VV	22-1	32R-6	402	57	36-12V	406	400-2	9	4434		2-121V	113	37-2
3/4	4132XP	4132RXP	N/A	37-3	415-3V	4173VV	22-1	32R-6	412	159	36-34V	416	410	9	4434		2-125V	113	37-2
1	4232XP	4232RXP	428	37-3	415-31V	4273VV	22-1	32R-6	422	58	36-1V	429	420	9	4434		N/A	113	37-2
1-1/4	4332XP	4332RXP	438	37-2	415-31V	4373VV	22-1	32R-6	432	434	36-114V	439	430	9	4434		N/A	113	37-2
1-1/2	4432XP	4432RXP	448	37-2	415-31V	4473VV	22-1	32R-6	442	93	36-112V	449	440	9	4434		N/A	113	37-2
2	4532XP	4532RXP	458	37-2	415-31V	4573VV	22-1	32R-6	452	176	36-2V	459	450	9	4434		2-40V	113	37-2
2-1/2	4632XP	4632RXP	468	37-2	415-31V	4673VV	24-1	32R-7	462	102	36-212V	469	460	9	4434		2-42V	113	37-2
3	4732XP	4732RXP	478	37-2	415-31V	4773VV	24-1	32R-7	472	474	36-3V	479	470	9	4434	2-46V	113	37-2	

18a	18b	19		20	Cv	Valve Size	Normally Closed			
N.C. XP Cover	N.O. XP Cover	Bolts	Washers	XP Base			A	B	C	Ship Weight
						(in)	(in)	(in)	(lbs)	
Q230	QR230	ALL	ALL	ALL	ALL	1/8	7	6.19	2.75	7
42NC	42NO	9-4	46-3	41A	1.3	1/4	7	6.19	2.75	7
42NC	42NO	9-4	46-3	41A	2.1	3/8	7	6.19	2.75	7
42NC	42NO	9-4	46-3	41A	2.3	1/2	7	6.19	2.75	7
42NC	42NO	9-4	46-3	41A	3.9	3/4	7.38	6.38	3.25	8
42NC	42NO	9-4	46-3	41A	5.1	1	7.63	6.44	3.81	9
42NC	42NO	9-4	46-3	41A	11.6	1-1/4	8.38	6.88	4.25	10
42NC	42NO	9-4	46-3	41A	12.1	1-1/2	8.88	7.25	4.88	12
42NC	42NO	9-4	46-3	41A	26	2	9.81	7.69	5.88	17
42NC	42NO	9-4	46-3	41A	48	2-1/2	10.13	8.25	7	22
42NC	42NO	9-4	46-3	41A	75	3	11.19	8.38	8.25	31

The Explosionproof housing is constructed of two (2) machined, enamel painted sand-cast gray iron parts bolted together, threaded onto the bonnet assembly and rigidly cemented in place. Once assembled the housing will **not** rotate. NEMA 4, NEMA 5, or NEMA 7 ratings are available with this housing.

Valve Size	Normally Open			
	A	B	C	Ship Weight
	(in)	(in)	(in)	(lbs)
1/8	8.13	7.31	2.75	8
1/4	8.13	7.31	2.75	8
3/8	8.13	7.31	2.75	8
1/2	8.13	7.31	2.75	8
3/4	8.50	7.50	3.25	9
1	8.75	7.56	3.81	10
1-1/4	9.50	8.00	4.25	11
1-1/2	10.00	8.38	4.88	13
2	10.94	8.81	5.88	18
2-1/2	11.25	9.38	7	22
3	12.31	9.50	8.25	31



SOLENOID VALVES

1/4", 3/8", & 1/2" NPT
TYPES B Series

2-WAY • CAST BRONZE BODIES • VELVETROL® INTERNAL PISTON PILOT OPERATED SOLENOID VALVES • NORMALLY CLOSED OR NORMALLY OPEN FULL PORT • MANUAL OPEN • ADJUSTABLE CLOSING SPEED



- ★ FOR: GENERAL SERVICE-AIR-INERT GASES-WATER-OIL-STEAM
- ★ PRESSURES: 5 PSI DIFFERENTIAL MINIMUM TO 1200 PSI MAXIMUM
- ★ TEMPERATURE: -40°F. MIN TO 450°F MAX. FLUID
- ★ MOUNTING: INSTALL IN HORIZONTAL LINE WITH COIL UPRIGHT AND ON TOP

SIZES 1/4", 3/8", & 1/2" NPT FULL PORT		
★ SERVICE RATINGS	Pricing, Service & Electrical Ratings shown in the List Price Schedule. Valves will be furnished for 5-150 PSI and 120 VAC Unless Otherwise Specified.	
NORMALLY CLOSED--		--NORMALLY OPEN
TYPE B	GENERAL SERVICE AIR-WATER-OIL-INERT GASES 5-150 PSI, 300°F. Max. Fluid, Class F Coil	TYPE BR
TYPE BS	GENERAL SERVICE AIR-WATER-OIL-INERT GASES 10-400 PSI, (10-300 Normally Open) 300°F. Max. Fluid, Class F Coil	TYPE BR
TYPE BST	LIQUID SERVICE ONLY 10-700 PSI, 300°F. Max. Fluid, Class F Coil	n/a
TYPE BHP	LIQUID SERVICE ONLY 20-1200 PSI, 300°F. Max. Fluid, Class F Coil	n/a
ADD L	PROVIDES ADJUSTMENT TO CONTROL FLOWRATE	ADD L
ADD -1	HIGH TEMP. (CLASS H) COILS - FLUID TEMP. TO 450°F. STEAM to 200 PSI.	ADD -1
ADD -2	EXPLOSION PROOF COIL HOUSING – CLASS I GROUP D, CLASS II GROUP E, F, G. NEMA 7	ADD -2
ADD -3B, -3EP -3T, -3V	LEAKPROOF PILOT SEAT: -3B (BUNA), -3EP ETHYLENE- PROPYLENE, -3T (TEFLON®) PTFE, -3V (VITON®) FLUOROCARBON	ADD -3B, -3EP -3T, -3V
ADD -24	WATER TIGHT COIL HOUSING - NEMA 4	ADD -24
ADD -25	DUST TIGHT COIL HOUSING - NEMA 5	ADD -25
ADD -57	MANUAL RESET/SAFETY SHUT-OFF, NO VOLTAGE RELEASE	ADD -57

★ **CONSTRUCTION:**

CLASS F & H COILS are Waterproof, Fungusproof, Molded of Filled Polyester with 18" Leads.
 BODIES are Sand Cast in Bronze rated 1200 psi, with 303 SS ADJUSTMENT STEMS.
 BONNET ASSEMBLIES are 304 SS TUBES silver soldered to Brass BONNET and TUBE PLUG.
 PISTON ASSEMBLIES are Brass with Filled Teflon® PISTON RINGS, Stainless Steel EXPANDERS, and Buna, EP, Fluorocarbon Or Virgin Teflon® SEAT DISCS. PISTON SPRINGS are 316 or 302 SS.
 PILOT ASSEMBLIES are 416 SS ARMATURE with a 316 SS PILOT POINT and 316 SS PINS.

★ **SPECIALS:**

Teflon® Coated Pistons & other Special Assemblies Available. Non-Standard Coils are Available with Voltage, Wattage, and Lead Wire Length to your specifications. Consult Factory.

★ **TERMS AND CONDITIONS OF SALE:** See the List Price Schedule.

PERFORMANCE, ORDERING AND INSTALLATION GUIDE

ORDERING DATA--SPECIFY PIPE SIZE, TYPE, FLUID, OPERATING PRESSURE, TEMPERATURE RANGE, ELECTRICAL SPECIFICATIONS, BACK PRESSURE (IF ANY).

FLOW CHARACTERISTICS--SEE FLOW CURVES IN BULLETIN 5-FL, OR C_v'S BELOW AND IN BULLETIN CP-1.

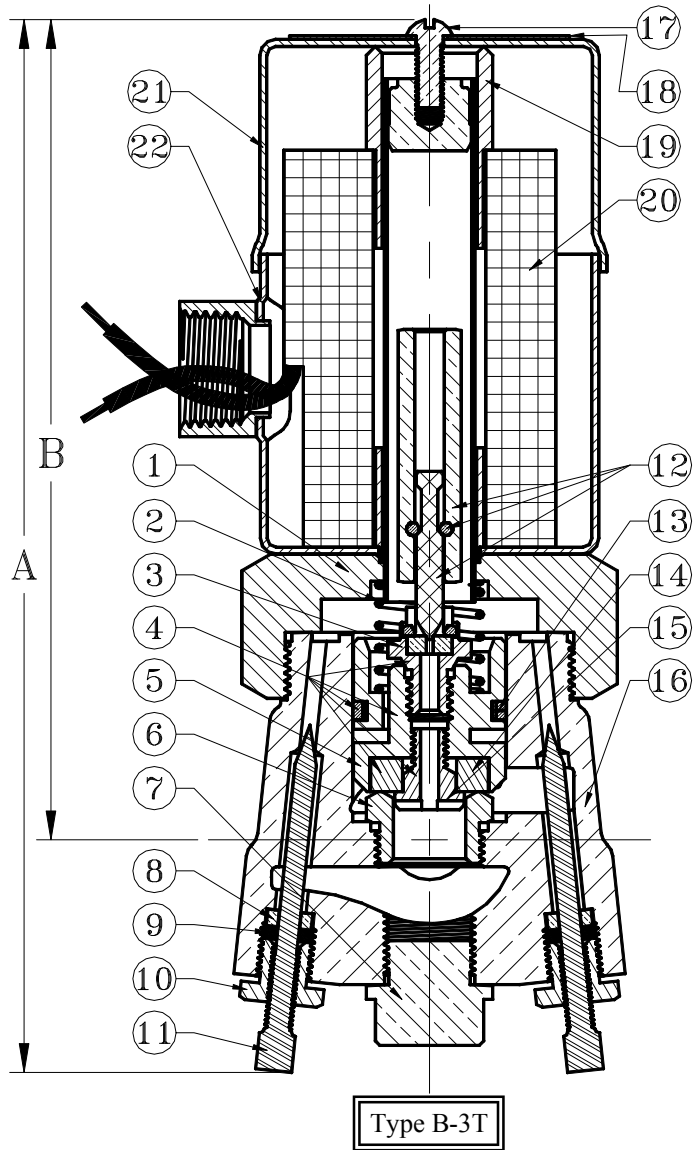
OPERATION--PISTON PILOT OPERATED. MINIMUM PRESSURE DROP OF 5 PSI (ΔP) IS REQUIRED ACROSS VALVE FOR OPERATION. TURN STEM MARKED "ADJ" CLOCKWISE TO INCREASE CLOSING TIME. TURN STEM MARKED "MAN OPN" COUNTER CLOCKWISE TO OPEN THE VALVE MANUALLY. TURN CLOCKWISE UNTIL SEATED TO CLOSE VALVE FOR NORMAL OPERATION.

MOUNTING--MOUNT IN HORIZONTAL LINE WITH COIL VERTICAL AND ON TOP. INSTALL 40 MESH STRAINER (NOT LARGER) AHEAD OF VALVE. CHECK FOR PROPER COIL VOLTAGE. MAKE SURE THAT THE FLOW ARROW ON VALVE BODY IS POINTING IN THE DIRECTION OF FLOW.

FLOW CONTROL--(Types BL & BSTL)--TURN FLOW CONTROL STEM (In Bottom Plug) CLOCKWISE to DECREASE FLOW, COUNTER CLOCKWISE TO INCREASE FLOW.

SERVICING--SOLENOID VALVES SHOULD BE FREQUENTLY CHECKED FOR OPERATION, CLEANLINESS, & INTERNAL WEAR - REPAIR KITS ARE FACTORY AVAILABLE --GIVE SIZE, TYPE, SERIAL NUMBER OR OPERATING DATA (VOLTAGE, PRESSURE, ETC.)

#	Part Description	Valve Type	1/4" • 3/8" • 1/2"
1	N. C. Bonnet Assembly	B	P30A
	N. O. Bonnet Assembly	BR	P30R
	N. C. Bonnet Assembly	B-2	P30XP
	N. O. Bonnet Assembly	BR-2	P30XPR
2	Piston Spring	ALL	37-14
	HP Piston Spring	ALL HP's	37-4
3	Seat Screw	ALL	31-4x
4	Piston Assembly	ALL	P29-1x
5	Piston Only	ALL	29
6	Seat Ring	ALL	34
7	Bottom Plug	ALL	35
	Flow Ctrl Btm Plug	ALL BL's	35-1
8	Packing Retainer	ALL	69
9	Packing	ALL	16
10	Packing Gland	ALL	15
11	Adjustment Stem	ALL	2-1
12	N.C. Pilot Assembly	B	P21-1
	N.O. Pilot Assembly	BR	P32R-2
	N.C. XP Pilot Assembly	B-2	P25-1
	N.O. XP Pilot Assembly	BR-2	P32R-1
13	Piston Ring & Expander	ALL	P57
14	Seat Disc	ALL	36-12x
15	Disc Screw	ALL	33
16	Body	ALL	28
17	Coil Screw	ALL	9
18	Nameplate	ALL	44-x
19	N.C. Top Nip	B	115-2
	N.O. Top Nip	BR	115-3
	XP End Plate	B-2 & BR-2	113
20	Coil	ALL	Consult Factory
21	N.C. Coil Cover	B	89
	N.O. Coil Cover	BR	89NO
	N.C. XP Coil Cover	B-2	42NC
	N.O. XP Coil Cover	BR-2	42NO
	XP Bolts	B-2 & BR-2	9-4
	XP Washers	B-2 & BR-2	46-3
23	Coil Housing	B & BR	87
	XP Coil Housing	B-2 & BR-2	41
	C _v Factor	1/4"	1.9
		3/8"	2.8
		1/2"	3.3
		ALL BL's	Adjustable



Dimension	B	BR	B-2	BR-2
A	7.3	8.3	7.9	9.0
B	5.7	6.7	6.3	7.4
End to End Length	2.8	2.8	2.8	2.8
Shipping Weight	5 lbs	5 lbs	9 lbs	9 lbs

SOLENOID VALVES

**3/4" - 2" NPT
TYPE D
Series**

2-WAY • CAST BRONZE BODIES • VELVETROL® INTERNAL PISTON PILOT OPERATED SOLENOID VALVES • NORMALLY CLOSED OR NORMALLY OPEN • FULL PORT • MANUAL OPEN • ADJUSTABLE CLOSING SPEED



- ★ FOR: GENERAL SERVICE-AIR-INERT GASES-WATER-OIL-STEAM
- ★ PRESSURES: 5 PSI DIFFERENTIAL MINIMUM TO 1200 PSI MAXIMUM
- ★ TEMPERATURE: -40°F. MIN TO 450°F MAX. FLUID
- ★ MOUNTING: INSTALL IN HORIZONTAL LINE WITH COIL UPRIGHT AND ON TOP

SIZES 3/4" – 2" NPT FULL PORT		
★ SERVICE RATINGS	Pricing, Service & Electrical Ratings shown in the List Price Schedule. Valves will be furnished for 5-150 PSI and 120 VAC Unless Otherwise Specified.	
NORMALLY CLOSED--		--NORMALLY OPEN
TYPE D	GENERAL SERVICE AIR-WATER-OIL-INERT GASES 5-150 PSI, 300°F. Max. Fluid, Class F Coil	TYPE DR
TYPE DS	GENERAL SERVICE AIR-WATER-OIL-INERT GASES 10-400 PSI, (10-300 Normally Open) 300°F. Max. Fluid, Class F Coil	TYPE DR
TYPE DST	LIQUID SERVICE ONLY 20-700 PSI, 300°F. Max. Fluid, Class F Coil	n/a
TYPE DHP	LIQUID SERVICE ONLY 20-1200 PSI, 300°F. Max. Fluid, Class F Coil	n/a
ADD L	PROVIDES ADJUSTMENT TO CONTROL FLOWRATE	ADD L
ADD -1	HIGH TEMP. (CLASS H) COILS - FLUID TEMP. TO 450°F. STEAM to 200 PSI.	ADD -1
ADD -2	EXPLOSION PROOF COIL HOUSING –NEMA 7, WATERTIGHT and Dust-tight	ADD -2
ADD -3B, -3EP -3T, -3V	LEAKPROOF PILOT SEAT: -3B (BUNA), -3EP (ETHYLENE- PROPYLENE), -3T (TEFLON®) PTFE, -3V (VITON®) FLUOROCARBON	ADD -3B, -3EP -3T, -3V
ADD -24	WATER TIGHT COIL HOUSING - NEMA 4	ADD -24
ADD -25	DUST TIGHT COIL HOUSING - NEMA 5	ADD -25
ADD -57	MANUAL RESET/SAFETY SHUT-OFF, NO VOLTAGE RELEASE.	ADD -57

- ★ **CONSTRUCTION:**
CLASS F & H COILS are Waterproof, Fungusproof, Molded of Filled Polyester with 18" Leads.
BODIES are Sand Cast in Bronze rated 1200 psi. PISTON SPRINGS are 316 or 302 SS.
BONNET ASSEMBLIES are 304 SS TUBES silver soldered to Brass BONNET and TUBE PLUG.
PISTON ASSEMBLIES are Brass with Filled Teflon® PISTON RINGS, Stainless Steel EXPANDERS, and Buna, EP, Fluorocarbon Or Virgin Teflon® SEAT DISCS.
PILOT ASSEMBLIES are 416 SS ARMATURE with a 316 SS PILOT POINT and 316 SS PINS.
- ★ **SPECIALS:**
Teflon® Coated Pistons & other Special Assemblies Available. Non-Standard Coils are Available with Voltage, Wattage, and Lead Wire Length to your specifications. Consult Factory.
- ★ **TERMS AND CONDITIONS OF SALE:** See the List Price Schedule.

PERFORMANCE, ORDERING AND INSTALLATION GUIDE

ORDERING DATA--SPECIFY PIPE SIZE, TYPE, FLUID, OPERATING PRESSURE, TEMPERATURE RANGE, ELECTRICAL SPECIFICATIONS, BACK PRESSURE (IF ANY).

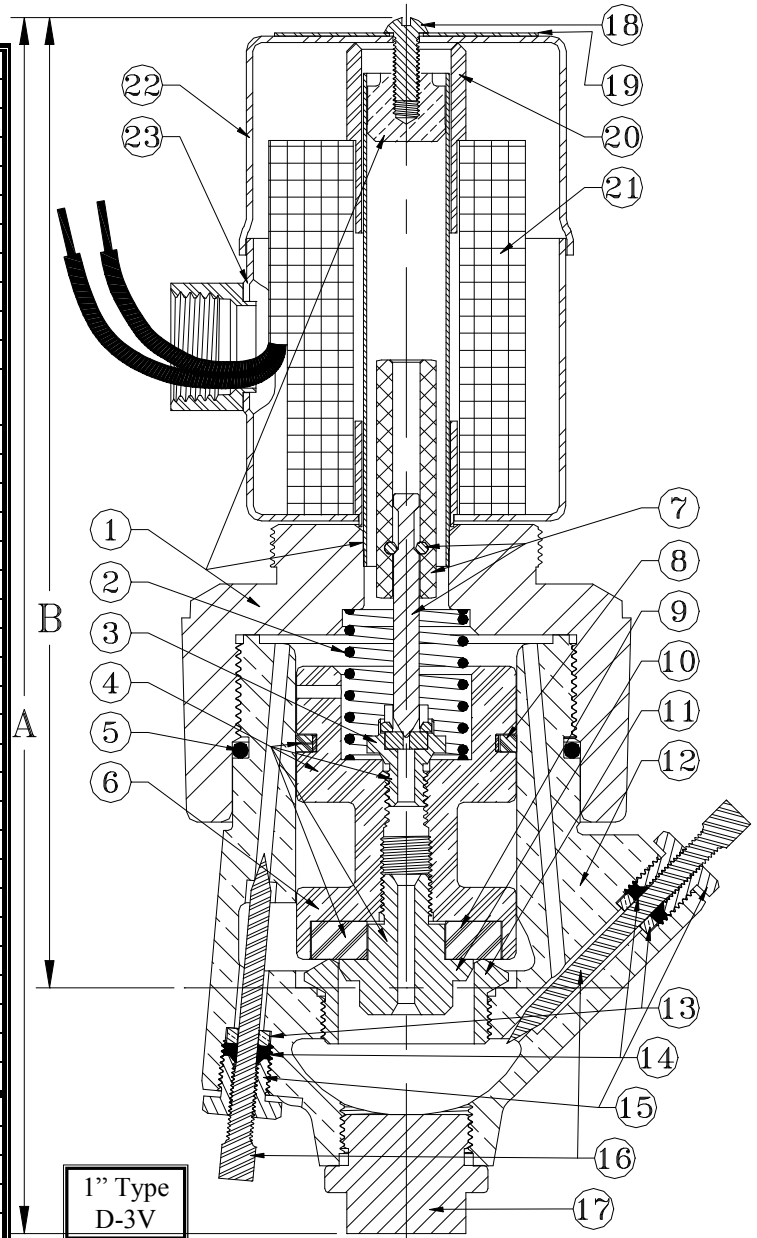
FLOW CHARACTERISTICS--SEE FLOW CURVES IN BULLETIN 5-FL, OR Cv FACTORS LISTED BELOW AND IN BULLETIN CP-1.

OPERATION--PISTON PILOT OPERATED. MINIMUM PRESSURE DROP OF 5 PSI (ΔP) IS REQUIRED ACROSS VALVE FOR OPERATION. TURN STEM MARKED "MAN OPN" COUNTER CLOCKWISE TO OPEN THE VALVE MANUALLY. TURN CLOCKWISE UNTIL SEATED TO CLOSE VALVE FOR NORMAL OPERATION.

MOUNTING--MOUNT IN HORIZONTAL LINE WITH COIL VERTICAL AND ON TOP. INSTALL 40 MESH STRAINER (NOT LARGER) AHEAD OF VALVE. CHECK FOR PROPER COIL VOLTAGE. MAKE SURE THAT THE FLOW ARROW ON VALVE BODY IS POINTING IN THE DIRECTION OF FLOW.

SERVICING--SOLENOID VALVES SHOULD BE FREQUENTLY CHECKED FOR OPERATION, CLEANLINESS, & INTERNAL WEAR - REPAIR KITS ARE FACTORY AVAILABLE --GIVE SIZE, TYPE, SERIAL NUMBER OR OPERATING DATA (VOLTAGE, PRESSURE, ETC.)

#	Part Description	Valve Type	3/4"	1"	1 1/4"	1 1/2"	2"
1	N. C. Bonnet Assembly	D & D-2	74XP	74XP	83XP	83XP	76XP
	N. O. Bonnet Assembly	DR & DR-2	74XPR	74XPR	83XPR	83XPR	76XPR
2	Piston Spring	ALL	37-2	37-2	37-2	37-2	37-2
	HP Piston Spring	ALL HP's	37-1	37-1	37-1	37-1	37-1
3	Seat Screw	ALL	31-x	31-x	31-x	31-x	31-x
4	Piston Assembly	ALL	P72	P72	P56-1	P56-1	P77-1
5	Bonnet Seal	ALL	2-228	2-228	2-235	2-235	2-240
6	Piston Only	ALL	72	72	56	56	77
7	N.C. Pilot Assembly	D & D-2	P22-1	P22-1	P22-1	P22-1	P22-1
	N.O. Pilot Assembly	DR & DR-2	P32R6	P34R6	P32R6	P32R6	P32R6
8	Piston Ring & Expander	ALL	P58	P58	P60	P60	P61
9	Seat Disc	ALL	36-1x	36-1x	36-112x	36-112x	36-2x
10	Disc Screw	ALL	27	27	53	53	80
11	Seat Ring	ALL	26	26	n/a	n/a	n/a
12	Body	ALL	P70-1	P70-2	P48	P49	P75
13	Packing Retainer	ALL	69	69	69	69	69
14	Packing	ALL	16	16	16	16	16
15	Packing Gland	ALL	15	15	15	15	15
16	Adjustment Stem	ALL	2-1	2-1	2-1	2-1	2-1
17	Bottom Plug	ALL	20	20	20	20	78
18	Coil Screw	ALL	9	9	9	9	9
19	Nameplate	ALL	44-x	44-x	44-x	44-x	44-x
20	N.C. Top Nip	D	115-2	115-2	115-2	115-2	115-2
	N.O. Top Nip	DR	115-3	114-3	115-3	115-3	115-3
	XP End Plate	D-2 & DR-2	113	113	113	113	113
21	Coil	Consult Factory or List Price Schedule					
22	N.C. Coil Cover	D	89	89	89	89	89
	N.O. Coil Cover	DR	89NO	89NO	89NO	89NO	89NO
	N.C. XP Coil Cover	D-2	42NC	42NC	42NC	42NC	42NC
	N.O. XP Coil Cover	DR-2	42NO	42NO	42NO	42NO	42NO
	Bolts	D-2 & DR-2	9-4	9-4	9-4	9-4	9-4
	Washers	D-2 & DR-2	46-3	46-3	46-3	46-3	46-3
23	Coil Housing	D & DR	87	87	87	87	87
	XP Coil Housing	D-2 & DR-2	41	41	41	41	41
	Dimension A	D	8.95	8.95	9.83	9.83	11.35
		DR	9.91	9.91	10.80	10.80	12.30
		D-2	9.05	9.05	9.99	9.99	11.50
		DR-2	10.20	10.20	11.11	11.11	12.61
	Dimension B	D	7.15	7.15	7.71	7.71	8.75
		DR	8.10	8.10	10.80	10.80	8.70
		D-2	7.25	7.25	7.86	7.86	8.86
		DR-2	8.40	8.40	8.99	8.99	9.99
	End to End Length	ALL	4.25	4.25	6.13	6.13	6.19
	Cv	ALL	6.3	11.5	18.0	28.0	50.0



Valve Weight (lb)	3/4"	1"	1 1/4"	1 1/2"	2"
D	12	13	24	26	30
DR	16	17	28	30	34
D-2	12	13	24	26	30
DR-2	16	17	28	30	34

SOLENOID VALVES

1/8" - 3" NPT
TYPES Q, A, B, D, F, G, GX, K, KX, AD, QD, KD

2-WAY BRASS, BRONZE, STAINLESS STEEL, VELVETROL® INTERNAL PISTON PILOT OPERATED, DIRECT LIFT OR ZERO DIFFERENTIAL SOLENOID VALVES FOR GENERAL SERVICE.
 NORMALLY CLOSED OR NORMALLY OPEN - FULL OR FRACTIONAL PORT



- ★ FOR: SYSTEMS REQUIRING A MANUAL RESET OF THE VALVE AFTER POWER LOSS
- ★ PRESSURES: 0 TO 1200 PSI MAXIMUM (DEPENDING ON TYPE)
- ★ TEMPERATURE: -40°F. to 300°F MAX. FLUID TEMP • CLASS F COILS
- ★ MOUNTING: INSTALL IN HORIZONTAL LINE WITH COIL UPRIGHT AND ON TOP

SIZES 1/8" – 3" NPT FULL PORT		
★ SERVICE RATINGS	Complete Pricing, Service & Electrical Ratings shown in the List Price Schedule. Valves will be furnished for 120VAC, 60hz Unless Otherwise Specified.	
NORMALLY CLOSED--		--NORMALLY OPEN
TYPE Q-3B-57, (also -3EP, -3V, -3T)	5-150, 10-400 PSI (Normally Open to 300 PSI) 12, 24, 120, 240, 480 VAC 50-60 Hz 6, 12, 24, 48, 115, 230 VDC	TYPE QR-3B-57, (also -3EP, -3V, -3T)
TYPE A-57 (also -3B, -3EP, -3V, -3T)	5-150 PSI, 10-400 PSI, 20-1000 PSI (Normally Open to 300 PSI) 12, 24, 120, 240, 480 VAC 50-60 Hz 6, 12, 24, 48, 115, 230 VDC	TYPE AR-57 (also -3B, -3EP, -3V, -3T)
TYPE B-57 (also -3B, -3EP, -3V, -3T)	5-150 PSI, 10-300 PSI (Normally Open to 300 PSI) 12, 24, 120, 240, 480 VAC 50-60 Hz 6, 12, 24, 48, 115, 230 VDC	TYPE BR-57 (also -3B, -3EP, -3V, -3T)
TYPE D-57 (also -3B, -3EP, -3V, -3T)	5-150 PSI, 10-400 PSI, 20-1200 PSI (Normally Open to 300 PSI) 12, 24, 120, 240, 480 VAC 50-60 Hz 6, 12, 24, 48, 115, 230 VDC	TYPE DR-57 (also -3B, -3EP, -3V, -3T)
TYPE F-57 (also -3B, -3EP, -3V, -3T)	0-600 PSI (Normally Open to 300 PSI) 12, 24, 120, 240, 480 VAC 50-60 Hz 6, 12, 24, 48, 115, 230 VDC	TYPE FR-57 (also -3B, -3EP, -3V, -3T)
TYPE G-57 (also -3B, -3EP, -3V, -3T)	0-600 PSI (Normally Open to 300 PSI) 12, 24, 120, 240, 480 VAC 50-60 Hz 6, 12, 24, 48, 115, 230 VDC	TYPE GR-57 (also -3B, -3EP, -3V, -3T)
TYPE GX-57 (also -3B, -3EP, -3V, -3T)	0-300 PSI (Normally Open to 300 PSI) 12, 24, 120, 240, 480 VAC 50-60 Hz 6, 12, 24, 48, 115, 230 VDC	TYPE GRX-57 (also -3B, -3EP, -3V, -3T)
TYPE K-57 (also -3B, -3EP, -3V, -3T)	5-125, 10-250 PSI 24, 120, 240, 480 VAC (50/60 Hz), 26 Watts Max. 6, 12, 24, 48, 115, 230 VDC, 24 Watts Max.	TYPE KR-57 (also -3B, -3EP, -3V, -3T)
TYPE KX-57 (also -3B, -3EP, -3V, -3T)	5-125, 10-250 PSI 24, 120, 240, 480 VAC (50/60 Hz), 26 Watts Max. 6, 12, 24, 48, 115, 230 VDC, 24 Watts Max.	TYPE KRX-57 (also -3B, -3EP, -3V, -3T)

★ **CONSTRUCTION:**

Valves are provided with CLASS F COILS that are Waterproof, Fungusproof, Molded of Filled Polyester, wired through a relay and a switch. All electrical components and associated wiring are contained in NEMA 1, COIL ENCLOSURES (junction box).

For additional information, such as individual part lists or dimensions please refer to Bulletins 200-Q, 400-A, 600-B, 620-D, 800-K, 1001-QKD, 4000-FG, and 5000-GX.

★ **SPECIALS:**

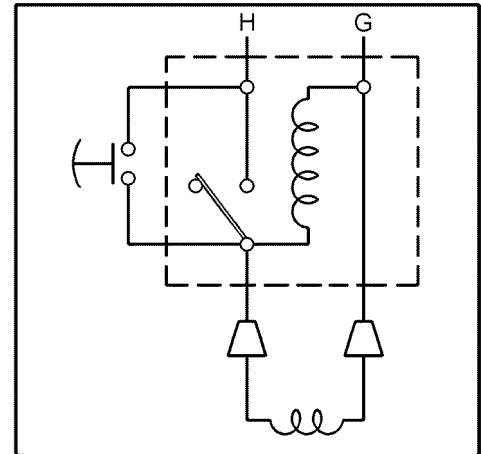
Consult Factory

OPERATION--All Type Q, A, B, & D Valves are PISTON PILOT OPERATED. Minimum pressure drop of 5 psi (ΔP) is required across valve for proper operation. Types F, G, & GX are DIRECT ACTING, with fractional port sizes. Types AD, QD & KD are DIRECT ACTING, full port, but with limited pressure range.

MOUNTING--Mount in horizontal line with coil vertical and on top. Install 40 mesh strainer (not larger) ahead of valve. Check for proper coil voltage. Make sure that the flow arrow on valve body is pointing in the direction of flow.

SERVICING--Solenoid Valves should be frequently checked for operation, cleanliness, & internal wear - Repair Kits are Factory Available --Give Size, Type, Serial Number or Operating Data (voltage, pressure, etc.)

GENERAL INFORMATION--These valves are designed specifically to **require human intervention to start**. Once the power to the valve is interrupted, whether by normal shutdown or by power outage, **the valve will remain in an off condition until power is re-supplied, AND the RESET BUTTON on the front of the coil housing de-pressed**



Wiring Schematic for Manual Reset Coil



Photo of Internal Coil Housing Detail

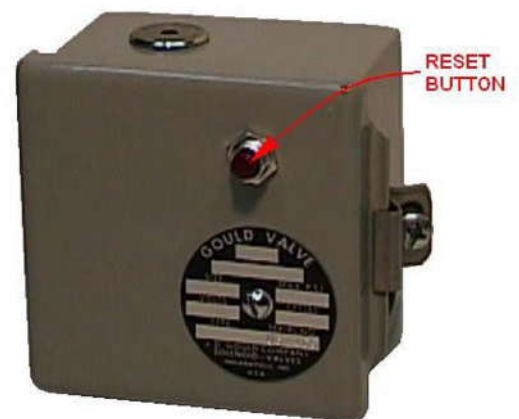


Photo Showing Reset Button Location

SOLENOID VALVES

1/8"•1/4"•3/8" NPT

TYPE B3 SERIES

2-WAY - CAST BRONZE BODIES - PACKLESS
DIRECT ACTING - LEAKPROOF
GENERAL PURPOSE SOLENOID VALVES
CLOSED WHEN DE-ENERGIZED



- ★ FOR: GENERAL SERVICE-AIR-WATER-LIGHT OIL-STEAM
- ★ PRESSURES: 0 MINIMUM TO RATED MAXIMUM
- ★ TEMPERATURE: CLASS F, 220°F MAX: CLASS H, 338°F MAX. FLUID TEMP.
- ★ MOUNTING: INSTALL IN HORIZONTAL LINE WITH COIL UPRIGHT AND ON TOP

SIZES 1/8" • 1/4" • 3/8" NPT 3/16" STANDARD PORT NORMALLY CLOSED

- ★ **SERVICE RATINGS** Complete Pricing, Service & Electrical Ratings shown in Price Schedule . B3-21 Valves will be furnished for 0-200 PSI and 120 VAC Unless Otherwise Specified.

TYPE B3-21 AIR 0-200 psi, WATER 0-125 psi
Class F: 220°F. Max. Fluid Temp., Class N: 338°F. Max. Fluid Temp.
24, 120, 240, 480, 120/240 VAC 60hz, 14 Watts Max.
12, 24, 48, 115, 230 VDC, 24 Watts Max.

TYPE BH-19 STEAM 0-100 psi
338°F Maximum Steam Temperature
120, 240, 480 VAC 60hz, 15 Watts

- ★ **CONSTRUCTION:**
CLASS F & H COILS are Waterproof, Fungusproof, Molded of Filled Polyester with 18" Leads.
BODIES are Sand Cast in 85-5-5-5 Bronze.
BONNET ASSEMBLIES are 304 SS TUBES Silver Soldered into a Brass BONNET with a Brass TUBE PLUG.
SEATSCREWS are Brass with PTFE O-RING.
PILOT ASSEMBLIES are 416 SS ARMATURE CASE with a 303 SS PILOT POINT AND 1018 CRS ARMATURE CORE
1/8"-3/8" NPTF GLOBE STYLE BODY WITH SCREW-DOWN BONNET

See Price Schedule for "Terms and Conditions of Sale."

PERFORMANCE, ORDERING AND INSTALLATION GUIDE

ORDERING DATA--SPECIFY PIPE SIZE, TYPE, FLUID, OPERATING PRESSURE, TEMPERATURE RANGE, ELECTRICAL SPECIFICATIONS.

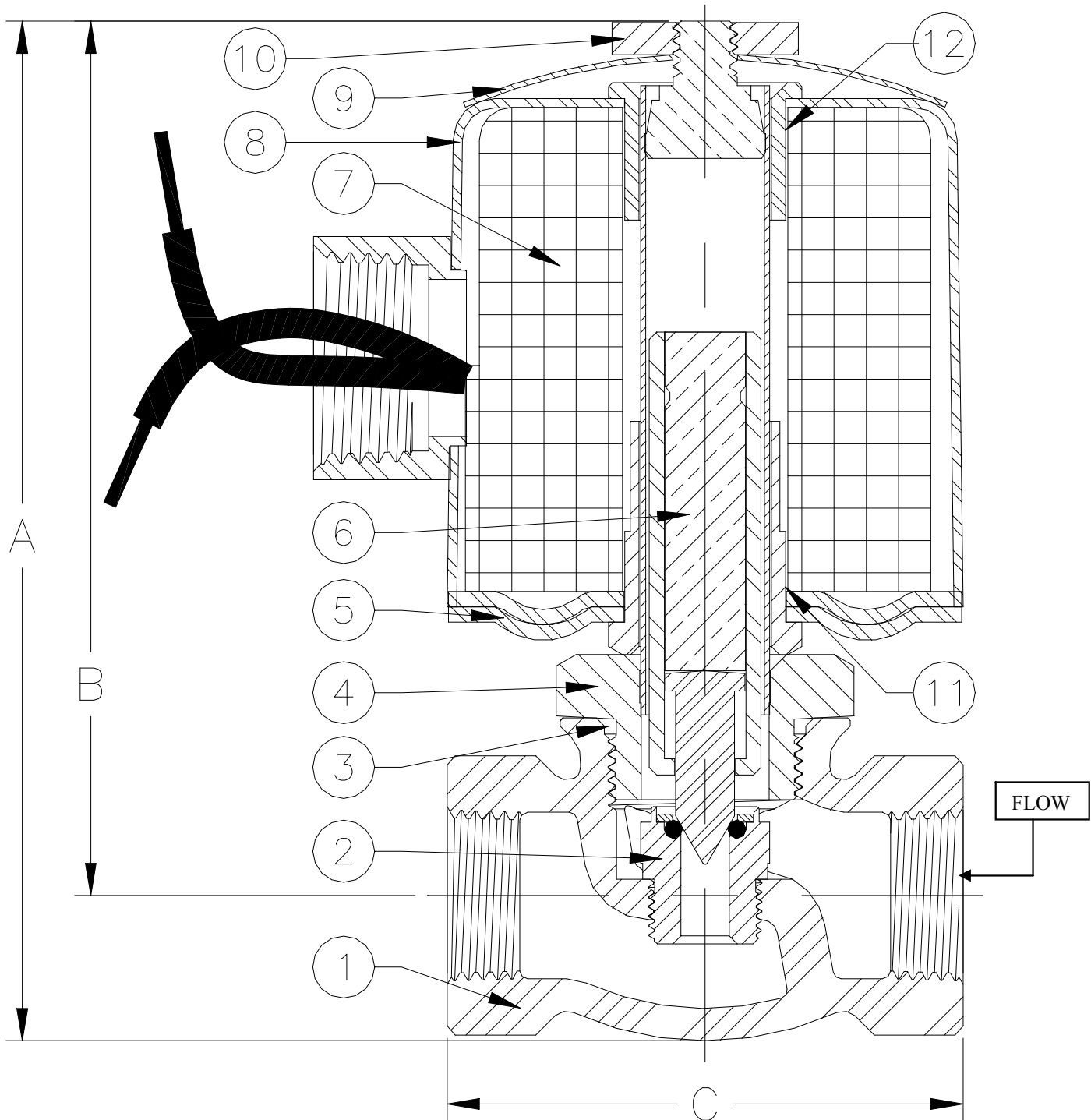
FLOW CHARACTERISTICS--SEE FLOW CURVES IN BULLETIN 5-FL, OR Cv FACTORS LISTED BELOW AND IN BULLETIN CP-1.

OPERATION--NO MINIMUM PRESSURE DROP IS REQUIRED FOR OPERATION.

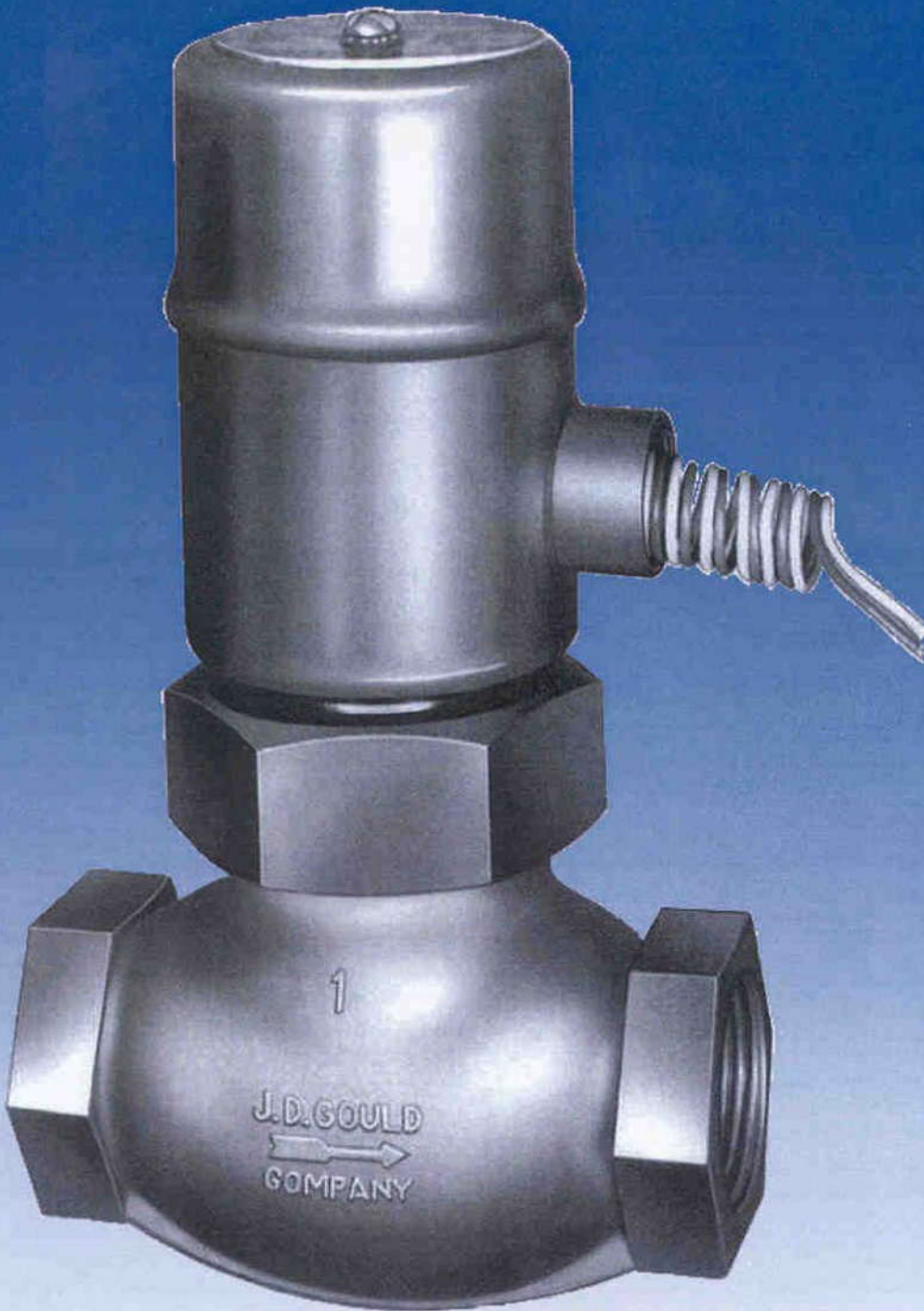
MOUNTING--MOUNT IN HORIZONTAL LINE WITH COIL VERTICAL AND ON TOP. INSTALL 40 MESH STRAINER (NOT LARGER) AHEAD OF VALVE. CHECK FOR PROPER COIL VOLTAGE. MAKE SURE THAT THE FLOW ARROW ON VALVE BODY IS POINTING IN THE DIRECTION OF FLOW.

SERVICING--SOLENOID VALVES SHOULD BE FREQUENTLY CHECKED FOR OPERATION, CLEANLINESS, & INTERNAL WEAR - REPAIR KITS ARE FACTORY AVAILABLE --GIVE SIZE, TYPE, SERIAL NUMBER OR OPERATING DATA (VOLTAGE, PRESSURE, ETC.)

Valve Size							Coil						Flow Data		Dimensions			
	1 Body	2 Seat Screw	3 Bonnet Seal	4 Bonnet Assembly	5 Coil Endplates	6 Pilot Assembly		8 Coil Can	9 Nameplate	10 Coil Nut	11 Bottom Nip	12 Top Nip	Orifice Size	Cv Factor	A	B	C	Ship Wt.
1/8	707-1	698	2-17	699	484	709	Consult the Factory	480	44-1-1	6-15	482-2	483	3/16	.70	3.94	3.38	2.0	2 lb
1/4	707-2	698	2-17	699	484	709		480	44-1-1	6-15	482-2	483	3/16	.70	3.94	3.38	2.0	2 lb
3/8	707-3	698	2-17	699	484	709		480	44-1-1	6-15	482-2	483	3/16	.70	3.94	3.38	2.0	2 lb



Stainless Steel Construction



Solenoid Valves

J.D. Gould Company, Inc.

J. D. Gould Company, Inc. www.mmcontrol.com/gouldvalve

Distributed By: M&M Control Service, Inc. phone: 800.876.0036 • fax: 847.356.0747

• e-mail: sales@mmcontrol.com

SOLENOID VALVES

**1/8"-2" NPT
TYPES K, KX,
KR, & KRX**

2-WAY – INVESTMENT CAST CF8M BODIES - PACKLESS
VELVETROL® INTERNAL PISTON PILOT OPERATED
GENERAL PURPOSE SOLENOID VALVES - FULL PORT
NORMALLY CLOSED OR NORMALLY OPEN

- ✎ FOR: GENERAL SERVICE-AIR-WATER-STEAM-INERT GASES
CORROSIVE FLUIDS (CONSULT FACTORY)
- ✎ PRESSURES: 5 PSI DIFFERENTIAL MINIMUM TO 1000 PSI MAXIMUM
- ✎ TEMPERATURE: -40°F TO 450°F. CLASS F OR H COILS
- ✎ MOUNTING: INSTALL IN HORIZONTAL LINE WITH COIL UPRIGHT AND ON TOP



SIZES 1/8" - 2" NPT FULL PORT

★ SERVICE RATINGS	Complete Pricing, Service & Electrical Ratings shown in Price Schedule. Valves will be furnished for 5-150 PSI and 120 VAC Unless Otherwise Specified.	
NORMALLY CLOSED--		--NORMALLY OPEN
TYPE K TYPE K-3T	5-150, 10-300 PSI; 300°F. MAX. FLUID, CLASS F STANDARD COILS: 120, 240, 480 VAC 60 Hz, 14W MAX. NON-STANDARD COILS AVAILABLE WITH VOLTAGE, WATTAGE, AND LEAD WIRE LENGTH TO YOUR SPECS.	TYPE KR TYPE KR-3T
TYPE KS	FOR LIQUIDS TO 700 PSI, NON-VOLATILE INERT GASES TO 400 PSI. TEMPERATURE TO 300°F	N/A
TYPE KST	FOR LIQUIDS TO 1000 PSI, TEMPERATURE TO 300°F	N/A
TYPE KX	SIMILAR TO TYPE K, EXCEPT 5-60 OR 5-150 PSI AND ALL WETTED PARTS ARE 316 SS OR PTFE (TEFLON®)	TYPE KRX
TYPE KX-3EP-EP-62	SPECIAL CONSTRUCTION FOR DEIONIZED WATER SERVICE – ETHYLENE PROPYLENE SEALS AND ALL WELDS PASSIVATED.	TYPE KRX-3EP-EP-62
TYPE KXS	SIMILAR TO KX EXCEPT 10-300 PSI (Norm. Open to 150 PSI)	TYPE KRX
ADD -1	HIGH TEMP. (CLASS H) COILS - FLUID TEMP. TO 450°F. 200 PSI STEAM.	ADD -1
ADD -2	EXPLOSION PROOF COIL HOUSING - NEMA 7	ADD -2
ADD -3B, -3EP -3T, -3V	LEAKPROOF PILOT SEAT: -3B (BUNA), -3EP ETHYLENE- PROPYLENE, -3T (TEFLON®) PTFE, -3V (VITON®) FLUOROCARBON	ADD -3B, -3EP -3T, -3V
ADD -24	WATER TIGHT, EXPLOSION PROOF COIL HOUSING. NEMA 4 & 7	ADD -24
ADD -25	DUST TIGHT, EXPLOSION PROOF COIL HOUSING. NEMA 5 & 7	ADD -25
ADD -57	MANUAL RESET – SAFETY SHUT-OFF, NO VOLTAGE RELEASE. SEE BULLETIN -57	ADD -57
ADD -81, -84	-81 SLOW CLOSE (REDUCES WATER HAMMER) -84 QUICK CLOSE (BOTH FACTORY SETUPS)	ADD -81, -84
ADD -230	SPECIAL CONSTRUCTION FOR GASOLINE AND DIESEL FUEL. SEE BULLETIN 230-K	ADD -230
ADD -SW,	PIPE CONNECTION: -SW SOCKET WELD	ADD -SW

★ **CONSTRUCTION:**

Type K & KX: CLASS F & H COILS are Waterproof, Fungusproof, Molded of Filled Polyester with 18" Leads. BODIES are Investment Cast in CF8M Stainless Steel. PISTON SPRINGS are 316 or 302 SS.

Type K: BONNET ASSEMBLIES are 304 SS TUBES welded to 303 SS BONNET and 303 SS TUBE PLUG. PISTON ASSEMBLIES are 303 SS with Glass & Moly Filled PTFE PISTON RINGS and 316 SS EXPANDERS. SEAT DISCS are Buna, EP, Fluorocarbon, and Virgin PTFE. PILOT ASSEMBLIES are 416 SS ARMATURE with a 316 SS PILOT POINT and 316 SS PINS.

Type KX: BONNET ASSEMBLIES are 316 SS TUBES welded to 316 SS BONNET and 316 SS TUBE PLUG. PISTON ASSEMBLIES are 316 SS with Glass & Moly Filled PTFE PISTON RINGS and 316 SS EXPANDERS. SEAT DISCS are Virgin PTFE. PILOT ASSEMBLIES are 316 SS JACKET welded over plain carbon steel CORE.

1/8"-1" GLOBE STYLE BODY WITH UNION BONNET
 1-1/4"-2" GLOBE STYLE BODY WITH BOLT-DOWN BONNET

See Price Schedule for "Terms and Conditions of Sale."

PERFORMANCE, ORDERING AND INSTALLATION GUIDE

ORDERING DATA--SPECIFY PIPE SIZE, TYPE, FLUID, OPERATING PRESSURE, TEMPERATURE RANGE, ELECTRICAL SPECIFICATIONS, BACK PRESSURE (IF ANY).

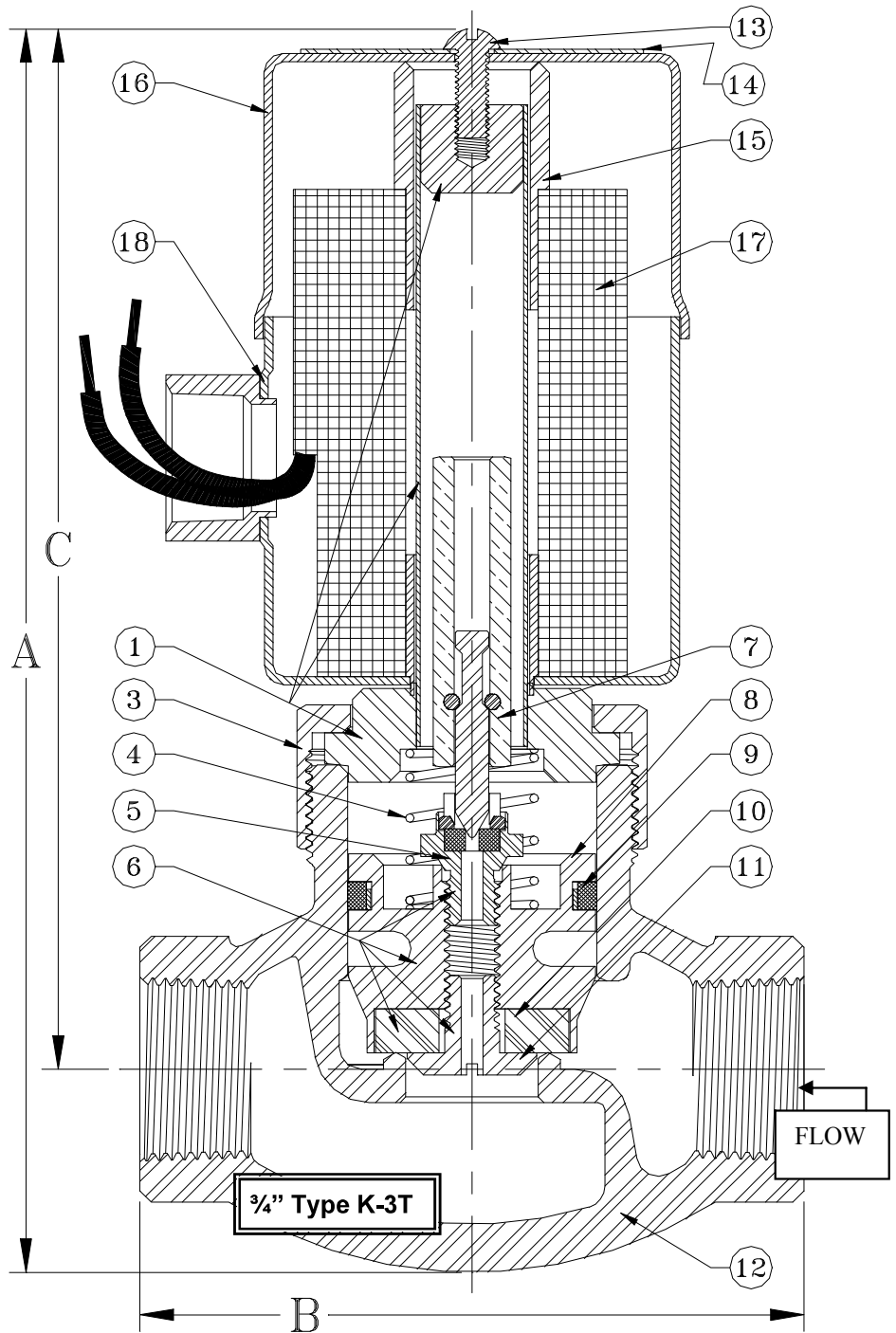
FLOW CHARACTERISTICS--SEE FLOW CURVES IN BULLETIN 5-FL, OR Cv FACTORS LISTED BELOW AND IN BULLETIN CP-1.

OPERATION--PISTON PILOT OPERATED. MINIMUM PRESSURE DROP OF 5 PSI (ΔP) IS REQUIRED ACROSS VALVE FOR OPERATION.

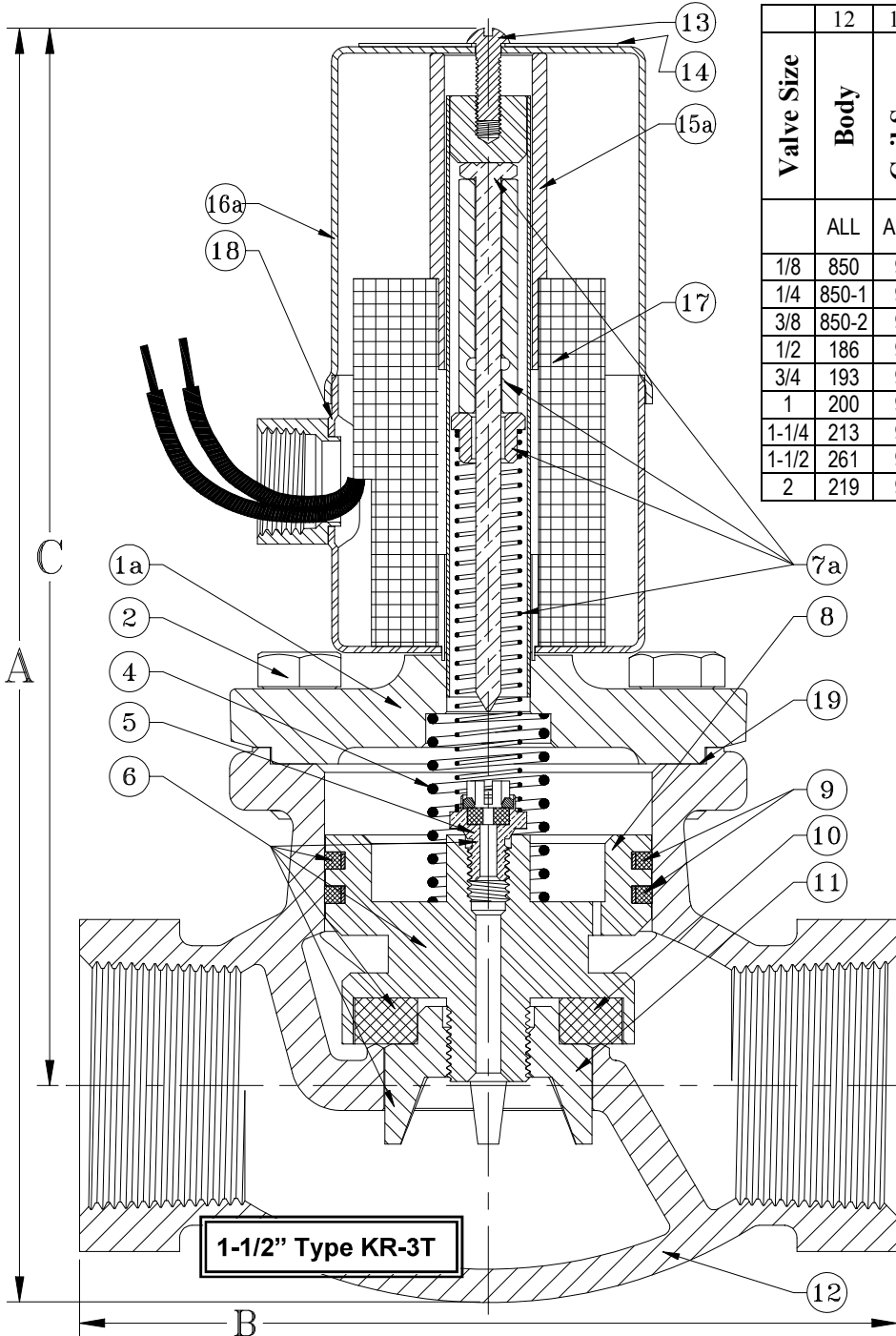
MOUNTING--MOUNT IN HORIZONTAL LINE WITH COIL VERTICAL AND ON TOP. INSTALL 40 MESH STRAINER (NOT LARGER) AHEAD OF VALVE. CHECK FOR PROPER COIL VOLTAGE. MAKE SURE THAT THE FLOW ARROW ON VALVE BODY IS POINTING IN THE DIRECTION OF FLOW.

OPERATING PRESSURE: THE SOLENOID VALVE SHOULD BE ORDERED WITH **THE MAXIMUM RATED PRESSURE CLOSEST TO THE ACTUAL PRESSURE THE VALVE WILL OPERATE IN.** FOR EXAMPLE: IF YOUR APPLICATION IS FOR 40 PSI, ORDER A VALVE RATED 5-150 PSI **NOT** 10-400 PSI.

SERVICING--SOLENOID VALVES SHOULD BE FREQUENTLY CHECKED FOR OPERATION, CLEANLINESS, & INTERNAL WEAR - REPAIR KITS ARE FACTORY AVAILABLE --GIVE SIZE, TYPE, SERIAL NUMBER OR OPERATING DATA (VOLTAGE, PRESSURE, ETC.)



Valve Size	1		1a		2	3	4	5		6		7		7a		8		9	10	11	
	N.C. Bonnet Assembly	N.O. Bonnet Assembly	Bonnet Bolts	Bonnet Ring	Piston Spring	Seat Screw	Piston Assembly	N.C. Pilot Assembly	N.O. Pilot Assembly	Piston Only	Piston Ring & Expander	Seat Disc	Guide Nut or Disc Screw								
	K	KX	KR	KRX	ALL	ALL	ALL	K/KR	KX/KRX	K/KR	KX/KRX	K	KX	KR	KRX	K/KR	KX/KRX	ALL	ALL	K/KR	KX/KRX
1/8	190	190316	190R	190R316	N/A	192	37-14	415-x2x	415-x3x	853	8531	21-1	2421	32R1K	242R4	402-2	402-3	57	36-12x	851	406S
1/4	190	190316	190R	190R316	N/A	192	37-14	415-x2x	415-x3x	853	8531	21-1	2421	32R1K	242R4	402-2	402-3	57	36-12x	851	406S
3/8	190	190316	190R	190R316	N/A	192	37-14	415-x2x	415-x3x	853	8531	21-1	2421	32R1K	242R4	402-2	402-3	57	36-12x	851	406S
1/2	190	190316	190R	190R316	N/A	192	37-14	31-x-303	31x316	187	187316	21-1	2421	32R1K	242R4	187	187316	189	36-12x	188	188316
3/4	197	197316	197R	197R316	N/A	199	37-14	31-x-303	31x316	194	194316	21-1	2421	32R1K	242R4	194	194316	196	36-34x	195	195316
1	204	204316	204R	204R316	N/A	206	37-14	31-x-303	31x316	201	201316	21-1	2421	32R1K	242R4	201	201316	203	36-1x	202	202
1-1/4	218	218316	218R	218R316	9-18	N/A	37-2	31-x-303	31x316	214	214316	22-1	2422	32R1K	242R6	214	214	216	36-112x	215	215
1-1/2	218	218316	218R	218R316	9-18	N/A	37-2	31-x-303	31x316	214	214316	22-1	2422	32R1K	242R6	214	214	216	36-112x	215	215
2	224	224316	224R	224R316	9-19	N/A	37-2	31-x-303	31x316	220	220316	22-1	2422	32R1K	242R6	220	220	222	36-2x	221	221



Valve Size	12	13	14	15	15a	16	16a	17	18	19
	Body	Coil Screw	Nameplate	N.C. Nip	N.O. Nip	N.C. Coil Cover	N.O. Coil Cover	Coil	Coil Can	Bonnet Seal
	ALL	ALL	ALL	K/KX	KR KRX	K/KX	KR KRX	ALL	K/KX	ALL
1/8	850	9	44-1-1	1152	1153	89	89NO	Consult	87	N/A
1/4	850-1	9	44-1-1	1152	1153	89	89NO	Factory or List Price Schedule	87	N/A
3/8	850-2	9	44-1-1	1152	1153	89	89NO		87	N/A
1/2	186	9	44-1-1	1152	1153	89	89NO	87	N/A	
3/4	193	9	44-1-1	1152	1153	89	89NO	87	N/A	
1	200	9	44-1-1	1152	1153	89	89NO	87	N/A	
1-1/4	213	9	44-1-1	1152	1153	89	89NO	87	2-151	
1-1/2	261	9	44-1-1	1152	1153	89	89NO	87	2-151	
2	219	9	44-1-1	1152	1153	89	89NO	87	2-154	

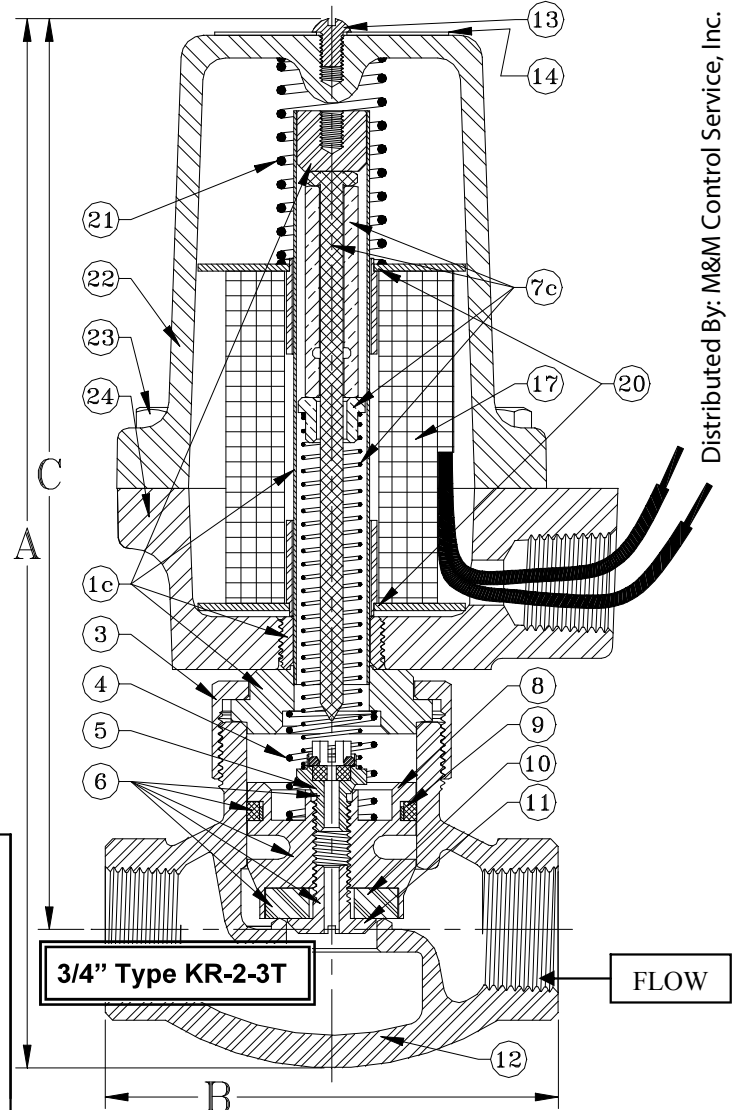
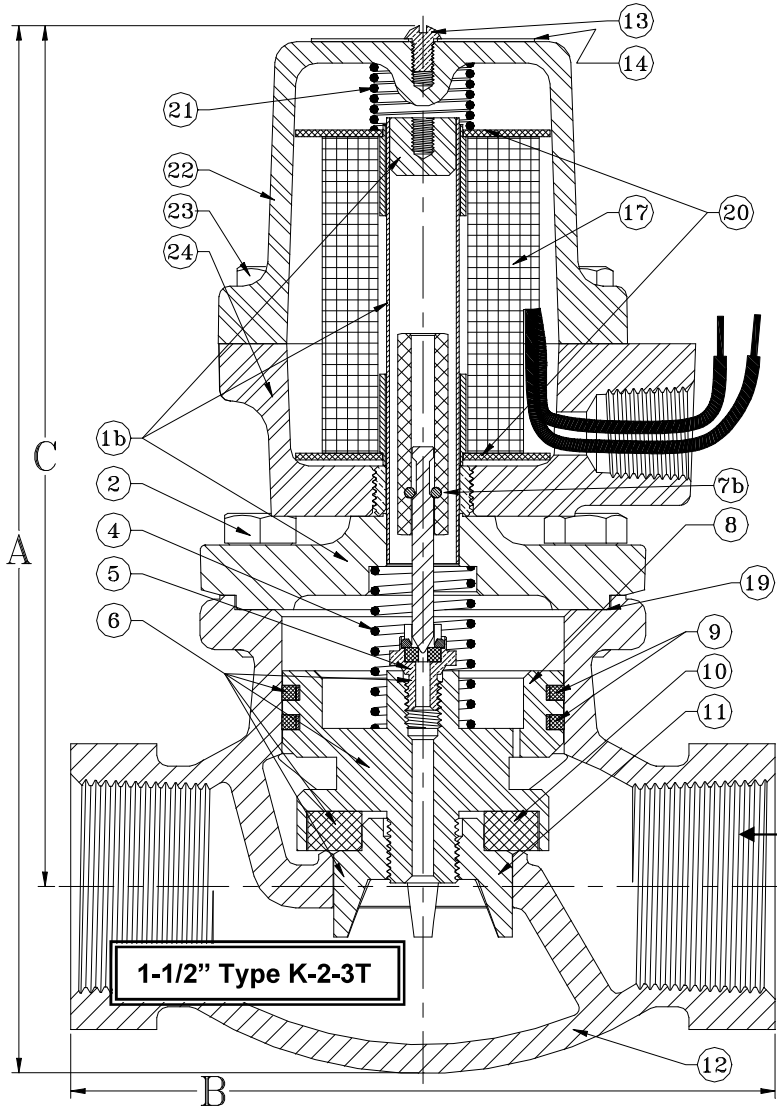
Valve Size	CV Factor	Valve Dimensions							
		N. C.				N. O.			
		A	B	C	wt lbs	A	B	C	wt lbs
1/8	1.1	6.03	2.63	5.34	3	7.03	2.63	6.34	4
1/4	2.1	6.03	2.63	5.34	3	7.03	2.63	6.34	4
3/8	3.2	6.03	2.63	5.34	3	7.03	2.63	6.34	4
1/2	3.9	6.75	3.13	5.88	4	7.75	3.13	6.88	4
3/4	7.5	7.02	3.75	5.88	4	8.02	3.75	6.88	5
1	9.9	7.44	4.16	6.19	5	8.44	4.16	7.19	5
1-1/4	23.0	8.56	6.13	6.94	11	9.56	6.13	7.94	12
1-1/2	25.0	8.56	6.13	6.94	11	9.56	6.13	7.94	12
2	45.0	9.38	6.45	7.39	17	10.38	6.45	8.39	17

Valve Size	1b N.C. XP Bonnet Assembly		1c N.O. XP Bonnet Assembly		7b N.C. XP Pilot Assembly		7c N.O. XP Pilot Assembly		20 Coil Endplates	21 Coil Spring	22 N.C. XP Cover N.O. XP Cover		23 XP Bolts XP Washers		24 XP Base
	K2	KX2	KR2	KRX2	K2	KX2	KR2	KRX2	K2/KX2 KR2/KRX2	K2/KX2 KR2/KRX2	K2 KX2	KR2 KRX2	K2/KX2 KR2/KRX2	K2/KX2 KR2/KRX2	K2/KX2 KR2/KRX2
1/8	190XP	190XP316	190RXP	190RXP316	25-1	2421	P32R6K	242R8	113	37-2	42NC	42NO	9-4	46-3	41A
1/4	190XP	190XP316	190RXP	190RXP316	25-1	2421	P32R6K	242R8	113	37-2	42NC	42NO	9-4	46-3	41A
3/8	190XP	190XP316	190RXP	190RXP316	25-1	2421	P32R6K	242R8	113	37-2	42NC	42NO	9-4	46-3	41A
1/2	190XP	190XP316	190RXP	190RXP316	25-1	2421	P32R6K	242R8	113	37-2	42NC	42NO	9-4	46-3	41A
3/4	197XP	197XP316	197RXP	197RXP316	25-1	2421	P32R6K	242R8	113	37-2	42NC	42NO	9-4	46-3	41A
1	204XP	204XP316	204RXP	204RXP316	25-1	2421	P32R6K	242R8	113	37-2	42NC	42NO	9-4	46-3	41A
1-1/4	218XP	218XP316	218RXP	218RXP316	22-1	2422	P32R6K	242R10	113	37-2	42NC	42NO	9-4	46-3	41A
1-1/2	218XP	218XP316	218RXP	218RXP316	22-1	2422	P32R6K	242R10	113	37-2	42NC	42NO	9-4	46-3	41A
2	224XP	224XP316	224RXP	224RXP316	22-1	2422	P32R6K	242R10	113	37-2	42NC	42NO	9-4	46-3	41A

size	A	B	C	wt
1/8	6.56	2.63	5.88	7
1/4	6.56	2.63	5.88	7
3/8	6.56	2.63	5.88	7
1/2	7.30	3.13	6.44	7
3/4	7.56	3.75	6.44	8
1	8.00	4.16	6.75	9
1-1/4	9.10	6.13	7.50	15
1-1/2	9.10	6.13	7.50	15
2	9.92	6.45	7.94	20

The Explosion proof housing is constructed of two (2) machined, enamel painted sand-cast gray iron parts bolted together, threaded onto the bonnet assembly and rigidly cemented in place. Once assembled the housing will **not** rotate. NEMA 4, NEMA 5, or NEMA 7 ratings are available with this housing.

size	A	B	C	wt
1/8	7.69	2.63	7.00	8
1/4	7.69	2.63	7.00	8
3/8	7.69	2.63	7.00	8
1/2	8.41	3.13	7.54	8
3/4	8.68	3.75	7.54	9
1	9.10	4.16	7.85	10
1-1/4	10.22	6.13	8.60	16
1-1/2	10.22	6.13	8.60	16
2	11.04	6.45	9.05	21



SOLENOID VALVES

**1/8"-2" NPT
TYPES K-230
& KR-230**

2-WAY – INVESTMENT CAST CF8M BODIES - PACKLESS
VELVETROL® INTERNAL PISTON PILOT OPERATED
SAFETY SOLENOID VALVES FOR HAZARDOUS LOCATIONS
NORMALLY CLOSED OR NORMALLY OPEN - FULL PORT
PETROLEUM BASED FLUIDS



- ★ FOR: CLASS1, GROUP D FOR GASOLINE, DIESEL FUEL, #1 AND #2 FUEL OIL
- ★ PRESSURES: 5 PSI DIFFERENTIAL MINIMUM TO 150 PSI MAXIMUM
- ★ TEMPERATURE: -40° TO 300° CLASS F COIL
- ★ MOUNTING: INSTALL IN HORIZONTAL LINE WITH COIL UPRIGHT AND ON TOP

SIZES 1/8" - 2" NPT FULL PORT		
★ SERVICE RATINGS	Complete Pricing, Service & Electrical Ratings shown in Price Schedule. Valves will be furnished for 5-150 PSI and 120 VAC Unless Otherwise Specified.	
NORMALLY CLOSED--		--NORMALLY OPEN
TYPE K-230	5-150 PSI; 300°F. Max. Fluid, Class F 120, 240, 480 VAC 60 Hz, 14 Watts Std. Other Voltages Available.	TYPE KR-230
ADD -81, -84	-81 SLOW CLOSE (REDUCES WATER HAMMER) -84 QUICK CLOSE (BOTH FACTORY SETUPS)	ADD -81, 84
ADD -SW	PIPE CONNECTION: -SW SOCKET WELD	ADD -SW

★ **CONSTRUCTION:**

CLASS F & H COILS are Waterproof, Fungusproof, Molded of Filled Polyester with 18" Leads.
BODIES are rated to 2500 psi, Investment Cast in CF8M Stainless Steel. PISTON SPRINGS are 316 or 302 SS.
BONNET ASSEMBLIES are 304 SS TUBES welded into a 303 SS or CF8M SS BONNET with a 303 SS or 316 SS TUBE PLUG.
PISTON ASSEMBLIES are 303 SS, 316 SS, or CF8M with Filled PTFE PISTON RINGS and 316 SS EXPANDERS.
SEAT DISCS are Fluorocarbon.
PILOT ASSEMBLIES are 416 SS ARMATURE with a 316 SS PILOT POINT and 316 SS PINS.
1/8"-1" GLOBE STYLE BODY WITH UNION BONNET
1-1/4"-2" GLOBE STYLE BODY WITH BOLT-DOWN BONNET

See List Price Schedule for "Terms and Conditions of Sale"

PERFORMANCE, ORDERING AND INSTALLATION GUIDE

ORDERING DATA--SPECIFY PIPE SIZE, TYPE, FLUID, OPERATING PRESSURE, TEMPERATURE RANGE, ELECTRICAL SPECIFICATIONS, BACK PRESSURE (IF ANY).

FLOW CHARACTERISTICS--SEE FLOW CURVES IN BULLETIN 5-FL, OR Cv FACTORS LISTED BELOW AND IN BULLETIN CP-1.

OPERATION--PISTON PILOT OPERATED. MINIMUM PRESSURE DROP OF 5 PSI (ΔP) IS REQUIRED ACROSS VALVE FOR OPERATION.

MOUNTING--MOUNT IN HORIZONTAL LINE WITH COIL VERTICAL AND ON TOP. INSTALL 40 MESH STRAINER (NOT LARGER) AHEAD OF VALVE. CHECK FOR PROPER COIL VOLTAGE. MAKE SURE THAT THE FLOW ARROW ON VALVE BODY IS POINTING IN THE DIRECTION OF FLOW.

SERVICING--SOLENOID VALVES SHOULD BE FREQUENTLY CHECKED FOR OPERATION, CLEANLINESS, & INTERNAL WEAR - REPAIR KITS ARE FACTORY AVAILABLE --GIVE SIZE, TYPE, SERIAL NUMBER OR OPERATING DATA (VOLTAGE, PRESSURE, ETC.)

Valve Size	1b	1c	2	3	4	5	6	7b	7c	8	9	10	11	12	13	14	17	19	20	21
	N. C. Bonnet Assembly	N. O. Bonnet Assembly	Bonnet Bolts	Bonnet Ring	Piston Spring	Seat Screw	Piston Assembly	N. C. Pilot Assembly	N. O. Pilot Assembly	Piston Only	Piston Ring & Expander	Seat Disc	Guide Nut/Disk Screw	Body	Coil Screw	Nameplate	Coil	Bonnet Seal	Coil Endplates	Coil Spring
	K230	KR230	ALL	ALL	ALL	ALL	ALL	K230	KR230	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	K230	KR230
1/8	190XP	190RXP	N/A	192	37-14	415-32V	TBD	25-1	P32R6K	402-2	57	36-12V	851	850	9	4434	Consult	N/A	113	37-2
1/4	190XP	190RXP	N/A	192	37-14	415-32V	TBD	25-1	P32R6K	402-2	57	36-12V	851	850-1	9	4434	Factory or Page 10 of the List Price Schedule	N/A	113	37-2
3/8	190XP	190RXP	N/A	192	37-14	415-32V	TBD	25-1	P32R6K	402-2	57	36-12V	851	850-2	9	4434		N/A	113	37-2
1/2	190XP	190RXP	N/A	192	37-14	31-3-V303	187230	25-1	P32R6K	187	189	36-12V	188	186	9	4434		N/A	113	37-2
3/4	197XP	197RXP	N/A	199	37-14	31-3-V303	194230	25-1	P32R6K	194	196	36-34V	195	193	9	4434		N/A	113	37-2
1	204XP	204RXP	N/A	206	37-14	31-3-V303	201230	25-1	P32R6K	201	203	36-1V	202	200	9	4434		N/A	113	37-2
1-1/4	218XP	218RXP	9-18	N/A	37-2	31-3-V303	214230	22-1	P32R6K	214	216	36-112V	215	213	9	4434		2-151	113	37-2
1-1/2	218XP	218RXP	9-18	N/A	37-2	31-3-V303	214230	22-1	P32R6K	214	216	36-112V	215	261	9	4434		2-151	113	37-2
2	224XP	224RXP	9-19	N/A	37-2	31-3-V303	220230	22-1	P32R6K	220	222	36-2V	221	219	9	4434	2-154	113	37-2	

N.C. XP Cover	N.O. XP Cover	Bolts	Washers	XP Base	CV Factor	Valve Size	Normally Closed			
							A	B	C	Ship Weight
K230	KR230	ALL	ALL	ALL			(in)	(in)	(in)	(lbs)
42NC	42NO	9-4	46-3	41A	1.1	1/8	6.56	2.63	5.88	7
42NC	42NO	9-4	46-3	41A	2.1	1/4	6.56	2.63	5.88	7
42NC	42NO	9-4	46-3	41A	3.2	3/8	6.56	2.63	5.88	7
42NC	42NO	9-4	46-3	41A	3.9	1/2	7.30	3.13	6.44	7
42NC	42NO	9-4	46-3	41A	7.5	3/4	7.56	3.75	6.44	8
42NC	42NO	9-4	46-3	41A	9.9	1	8.00	4.16	6.75	9
42NC	42NO	9-4	46-3	41A	23.0	1-1/4	9.10	6.13	7.50	11
42NC	42NO	9-4	46-3	41A	25.0	1-1/2	9.10	6.13	7.50	13
42NC	42NO	9-4	46-3	41A	45.0	2	9.92	6.45	7.94	21

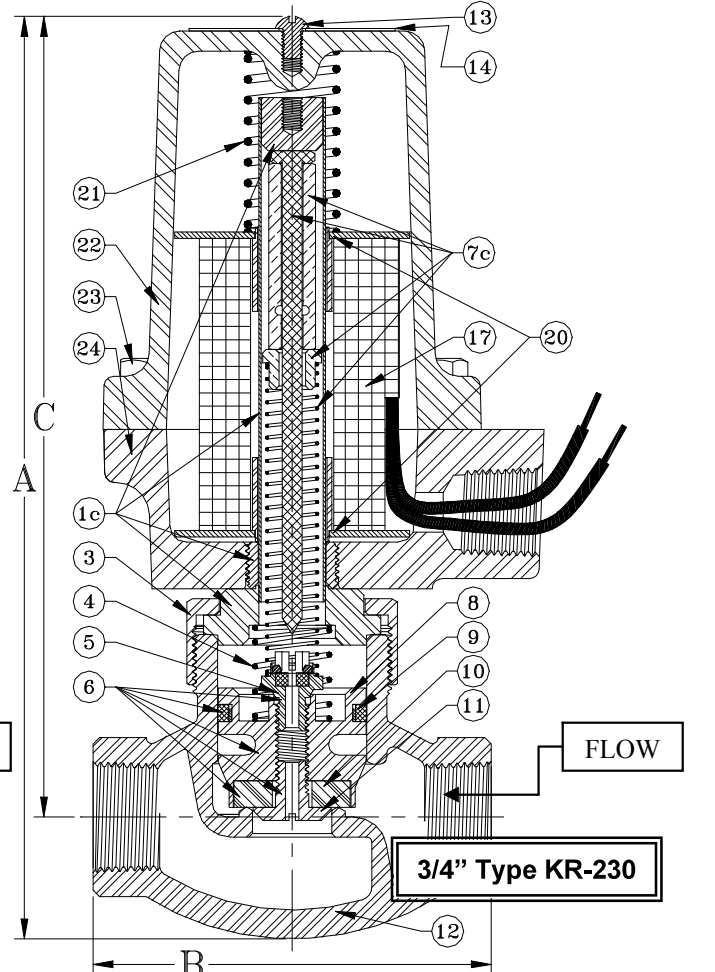
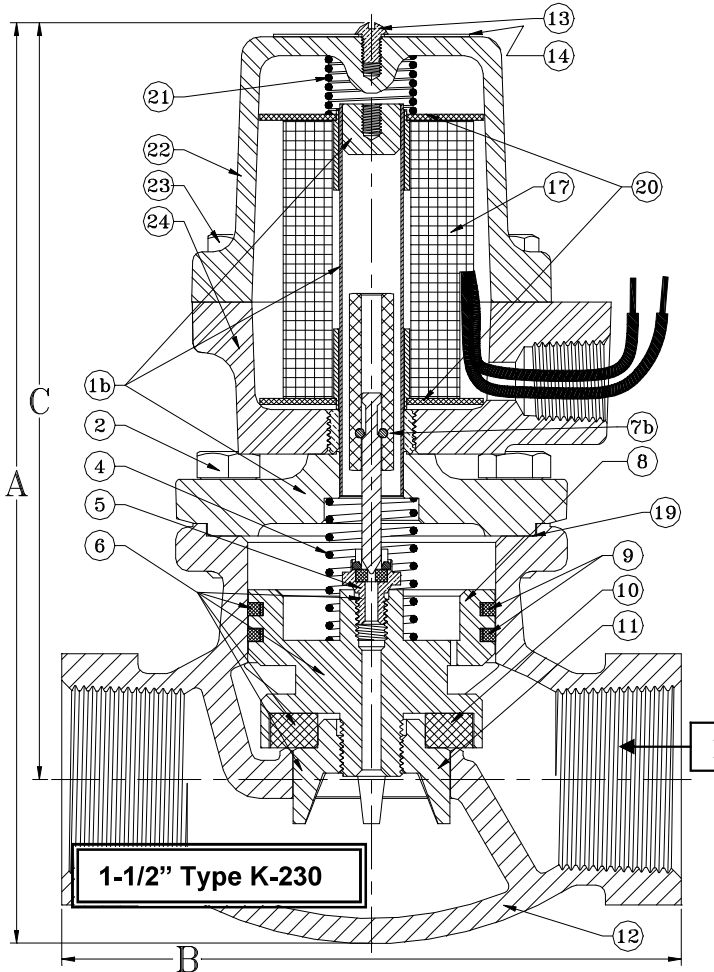
Physical Dimensions

The Explosionproof housing is constructed of two (2) machined, enamel painted sand-cast gray iron parts bolted together, threaded onto the bonnet assembly and rigidly cemented in place. Once assembled the housing will *not* rotate.

NEMA 4, NEMA 5, or NEMA 7 ratings are available.

Valve Size	Normally Open			
	A	B	C	Ship Weight
	(in)	(in)	(in)	(lbs)
1/8	7.69	2.63	7.00	8
1/4	7.69	2.63	7.00	8
3/8	7.69	2.63	7.00	8
1/2	8.41	3.13	7.54	8
3/4	8.68	3.75	7.54	10
1	9.10	4.16	7.85	11
1-1/4	10.22	6.13	8.60	14
1-1/2	10.22	6.13	8.60	16
2	11.04	6.45	9.05	23

Physical Dimensions



SOLENOID VALVES

1/8" • 1/4" • 3/8" NPT
**TYPES F & G
 SERIES**

2-WAY • PACKLESS • DIRECT ACTING
 GENERAL PURPOSE SOLENOID VALVES
 NORMALLY CLOSED OR NORMALLY OPEN • FRACTIONAL PORT

- ★ SIZES: 1/8", 1/4", 3/8" NPT • FRACTIONAL ORIFICE
- ★ TYPE F: BRASS BODY
- ★ TYPE G: 303 STAINLESS STEEL BODY
- ★ FOR: GENERAL SERVICE-AIR-INERT GASES-WATER-OIL-STEAM
- ★ PRESSURES: 0 TO RATED MAXIMUM
- ★ TEMPERATURE: -40°F. MIN TO 450°F MAX. FLUID
- ★ MOUNTING: INSTALL IN HORIZONTAL LINE WITH COIL UPRIGHT AND ON TOP



SIZES 1/8" - 3/8" NPT FRACTIONAL PORT										
★ SERVICE RATINGS	Pricing, Service & Electrical Ratings shown in the List Price Schedule.									
	Valves will be furnished for 150 psi Air & Water Service and 120 VAC Unless Otherwise Specified.									
GENERAL SERVICE: AIR-WATER-OIL-INERT GAS 0 to Maximum Operating Pressure Differential 300°F. Max. Fluid Temperature Class F Coil 12, 24, 55, 120, 240, 480 VAC 50/60 Hz 12, 24, 32, 115, 230 VDC	MAXIMUM OPERATING PRESSURE DIFFERENTIAL									
	TYPE		ORIFICE	1/4"	7/32"	3/16"	5/32"	1/8"	3/32"	1/16"
	NORMALLY CLOSED	F G 14 WATTS	AIR-GAS	40	50	120	175	300	550	800
			WATER	30	45	60	90	140	250	500
			OIL	15	24	32	45	75	130	230
	Norm Open	FST GST 26 WATTS	AIR-GAS	130	180	250	360	600	1000	1000
			WATER	30	50	80	110	180	320	600
			OIL	20	30	40	70	110	200	500
	Norm Open	FR GR 14 WATTS	AIR-GAS	20	40	60	90	150	270	300
			WATER	15	25	30	45	70	125	250
OIL			6	10	16	23	35	60	115	
HIGH TEMP. SERVICE: AIR-INERT GASES-STEAM- HOT LIQUIDS 0 to Maximum Operating Pressure Differential 450°F. Max. Fluid Temperature Class H Coil 120, 240, 480 VAC 50/60 Hz,	MAXIMUM OPERATING PRESSURE DIFFERENTIAL									
	TYPE		ORIFICE	1/4"	7/32"	3/16"	5/32"	1/8"	3/32"	1/16"
	Norm Closed	F-1 G-1 20 WATTS	AIR-GAS	40	80	120	175	300	550	800
			WATER	30	45	60	90	140	250	500
			OIL	15	24	32	45	75	130	230
			STEAM	40	80	120	200	200	200	200
	Norm Open	FR-1 GR-1 20 WATTS	AIR-GAS	20	40	60	90	150	270	300
			WATER	15	25	30	45	70	125	150
			OIL	6	10	16	23	35	60	150
			STEAM	20	40	60	90	150	200	200
ADD -2	EXPLOSION PROOF COIL HOUSING - NEMA 7									
ADD -3B, -3EP, -3T, -3V	LEAKPROOF PILOT SEAT: -3B (BUNA), -3EP ETHYLENE- PROPYLENE, -3T (TEFLON®) PTFE, -3V (VITON®) FLUOROCARBON									
ADD -24	WATER TIGHT COIL HOUSING - NEMA 4 & NEMA 7									
ADD -25	DUST TIGHT COIL HOUSING - NEMA 5 & NEMA 7									
ADD -57	MANUAL RESET, SAFETY SHUT-OFF, NO VOLTAGE RELEASE.									

★ **CONSTRUCTION:** CLASS F & H COILS are Waterproof, Fungusproof, Molded of Filled Polyester with 18" Leads. 303 Stainless Steel PLUNGER TUBE is Silver Soldered or Welded into the 90° Angled, Brass, or 303 Stainless Steel BODY, providing side inlet and bottom outlet. PILOT ASSEMBLY is a 416 SS ARMATURE connected to the 303 SS POINT, that provides direct opening and closing of the valve. All COIL HOUSINGS have 1/2" threaded conduit connections.

- ★ **SPECIALS:** Teflon® Coated Pilot & other Special Assemblies Available. Non-Standard Coils are Available with Voltage, Wattage, and Lead Wire Length to your specifications. Consult Factory.
- ★ **TERMS AND CONDITIONS OF SALE:** See the List Price Schedule

PERFORMANCE, ORDERING AND INSTALLATION GUIDE

ORDERING DATA--SPECIFY PIPE SIZE, TYPE, FLUID, OPERATING PRESSURE, TEMPERATURE RANGE, ELECTRICAL SPECIFICATIONS, BACK PRESSURE (IF ANY).

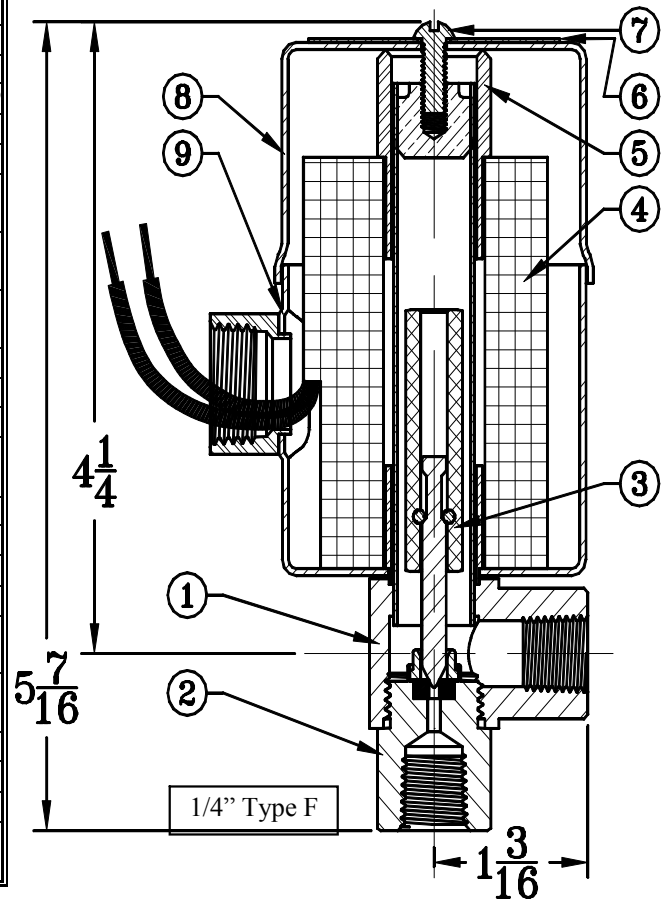
FLOW CHARACTERISTICS--SEE FLOW CURVES IN BULLETIN 5-FL, OR Cv FACTORS LISTED BELOW AND IN BULLETIN CP-1.

OPERATION--DIRECT ACTING FOR OPERATION FROM 0 TO RATED PRESSURE.

MOUNTING--MOUNT IN HORIZONTAL LINE WITH COIL VERTICAL AND ON TOP. INSTALL 40 MESH STRAINER (NOT LARGER) AHEAD OF VALVE. CHECK FOR PROPER COIL VOLTAGE. MAKE SURE THAT THE FLOW INLET IS ON THE SIDE AND THE OUTLET IS DOWN.

SERVICING--SOLENOID VALVES SHOULD BE FREQUENTLY CHECKED FOR OPERATION, CLEANLINESS, & INTERNAL WEAR - REPAIR KITS ARE FACTORY AVAILABLE --GIVE SIZE, TYPE, SERIAL NUMBER OR OPERATING DATA (VOLTAGE, PRESSURE, ETC.)

#	Part Description	NEMA Rating	TYPES F, -2,-24,-25			TYPES G, -2,-24,-25		
			1/8"	1/4"	3/8"	1/8"	1/4"	3/8"
1	Body	1	P1801F	P1802F	P1803F	P1801G	P1802G	P1803G
	XP Body	4, 5, 7	P1801FXP	P1802FXP	P1803FXP	P1801GXP	P1802GXP	P1803GXP
	N.O. Body	1	P1801FR	P1802FR	P1803FR	P1801GR	P1802GR	P180GR
	N.O. XP Body	4, 5, 7	P1801FRXP	P1802FRXP	P1803FRXP	P1801GRXP	P1802GRXP	P1803GRXP
2	Body Nut	ALL	1811Fx	1812Fx	1813Fx	1811Gx	1812Gx	1813Gx
3	Pilot Assembly	1	P21-1	P21-1	P21-1	P21-1	P21-1	P21-1
	XP Pilot Assembly	4, 5, 7	P25-1	P25-1	P25-1	P25-1	P25-1	P25-1
	N.O. Pilot Assembly	1	P32R1	P32R1	P32R1	P32R1	P32R1	P32R1
	N.O. XP Pilot Assembly	4, 5, 7	P32R1	P32R1	P32R1	P32R1	P32R1	P32R1
4	Coil	ALL	Consult Factory Or List Price Schedule					
5	Top Nip	1	115-2	115-2	115-2	115-2	115-2	115-2
	XP End Plate	4, 5, 7	113	113	113	113	113	113
	N.O. Top Nip	1	115-3	115-3	115-3	115-3	115-3	115-3
6	Nameplate	ALL	44-1x	44-1x	44-1x	44-1x	44-1x	44-1x
7	Screw	ALL	9	9	9	9	9	9
8	Coil Cover	1	89	89	89	89	89	89
	XP Coil Cover	4, 5, 7	42NC	42NC	42NC	42NC	42NC	42NC
	N.O. Coil Cover	1	89NO	89NO	89NO	89NO	89NO	89NO
	N.O. XP Coil Cover	4, 5, 7	42NO	42NO	42NO	42NO	42NO	42NO
	Bolts	4, 5, 7	9-4	9-4	9-4	9-4	9-4	9-4
	Washers	4, 5, 7	46-3	46-3	46-3	46-3	46-3	46-3
9	Coil Housing	1	87	87	87	87	87	87
	XP Coil Housing	4, 5, 7	41A	41A	41A	41A	41A	41A



Physical Dimensions

Orifice	3/64"	1/16"	5/64"	3/32"	7/64"	1/8"	5/32"	3/16"	7/32"	1/4"
Cv	0.05	0.08	0.12	0.18	0.26	0.30	.50	.70	1.00	1.20

Shipping Weight for all NEMA 1 Type F & G Valves is 3 lbs

Shipping Weight for all NEMA 4, 5, & 7 Type F & G (-2) Valves is 7 lbs

For Height Values of NEMA 4, 5, & 7 Valves Add 0.69"

For Height Values of Normally Open Valves Add 1.00"

For Height Values of Normally Open, NEMA 4, 5, & 7 Valves Add 1.75"

SOLENOID VALVES

1/8" • 1/4" • 3/8" NPT

TYPE GX SERIES

2-WAY • PACKLESS • DIRECT ACTING
GENERAL PURPOSE SOLENOID VALVES
NORMALLY CLOSED OR NORMALLY OPEN • FRACTIONAL PORT

- ★ SIZES: 1/8", 1/4", 3/8" NPT • FRACTIONAL ORIFICE
- ★ MAT'L: ALL INTERNAL PARTS ARE 316 STAINLESS STEEL
- ★ FOR: CORROSIVE SERVICE-AIR-INERT GASES-WATER-OIL-STEAM
- ★ PRESSURES: 0 TO RATED MAXIMUM
- ★ TEMPERATURE: -40°F. MIN TO 450°F MAX. FLUID
- ★ MOUNTING: INSTALL IN HORIZONTAL LINE WITH COIL UPRIGHT AND ON TOP



SIZES 1/8" - 3/8" NPT FRACTIONAL PORT

★ **SERVICE RATINGS**

Pricing, Service & Electrical Ratings shown in the List Price Schedule.
Valves will be furnished for 60 psi Air & Water Service and 120 VAC Unless Otherwise Specified.

CORROSIVE SERVICE: AIR-WATER-OIL-INERT GAS 0 to Maximum Operating Pressure Differential 300°F. Max. Fluid Temperature Class F Coil 12, 24, 55, 120, 240, 480 VAC 50/60 Hz 12, 24, 32, 115, 230 VDC	MAXIMUM OPERATING PRESSURE DIFFERENTIAL									
	TYPE		ORIFICE	1/4"	7/32"	3/16"	5/32"	1/8"	3/32"	1/16"
	NORMALLY CLOSED	GX 26 WATTS MAX	AIR-GAS	15	23	30	45	60	120	200
WATER			10	15	20	30	45	80	150	
OIL			5	8	10	15	27	40	75	
GX5 26 WATTS MAX		AIR-GAS	40	82	120	175	300	300	300	
		WATER	30	46	60	90	140	250	300	
		OIL	15	24	32	45	75	130	230	
NORM OPEN	GRX 26 WATTS MAX	AIR-GAS	40	46	50	70	100	150	250	
		WATER	28	33	36	60	70	100	200	
		OIL	10	13	15	25	35	50	100	

HIGH TEMP. SERVICE: AIR-INERT GASES-STEAM- HOT LIQUIDS 0 to Maximum Operating Pressure Differential 450°F. Max. Fluid Temperature Class H Coil 120, 240, 480 VAC 50/60 Hz,	MAXIMUM OPERATING PRESSURE DIFFERENTIAL									
	TYPE		ORIFICE	1/4"	7/32"	3/16"	5/32"	1/8"	3/32"	1/16"
	NORMALLY CLOSED	GX-1 28 WATTS MAX	AIR-GAS	15	18	20	30	45	65	120
WATER			10	13	15	20	30	45	80	
OIL			5	6	7	10	15	20	40	
STEAM			15	18	20	30	45	65	120	
NORMALLY OPEN	GRX-1 28 WATTS MAX	AIR-GAS	28	32	35	50	70	100	150	
		WATER	20	23	25	40	50	70	150	
		OIL	7	8	10	16	25	35	70	
		STEAM	28	32	35	50	70	100	150	

ADD -2	EXPLOSION PROOF COIL HOUSING – NEMA 7
ADD -3B, -3EP, -3T, -3V	LEAKPROOF PILOT SEAT: -3B (BUNA), -3EP ETHYLENE- PROPYLENE, -3T (TEFLON®) PTFE, -3V (VITON®) FLUOROCARBON
ADD -24	WATER TIGHT COIL HOUSING - NEMA 4 & NEMA 7
ADD -25	DUST TIGHT COIL HOUSING - NEMA 5 & NEMA 7
ADD -57	MANUAL RESET, SAFETY SHUT-OFF, NO VOLTAGE RELEASE.

★ **CONSTRUCTION:** CLASS F & H COILS are Waterproof, Fungusproof, Molded of Filled Polyester with 18" Leads. 316 Stainless Steel PLUNGER TUBE is Welded into the 90° Angled 316 Stainless Steel BODY, providing side inlet and bottom outlet. The PILOT has a 316 SS JACKET Welded around a carbon steel CORE, that provides direct opening and closing of the valve. All COIL HOUSINGS have 1/2" threaded conduit connections.

- SPECIALS:** Teflon® Coated Pilot & other Special Assemblies Available. Non-Standard Coils are Available with Voltage, Wattage, and Lead Wire Length to your specifications. Consult Factory.
- TERMS AND CONDITIONS OF SALE:** See the List Price Schedule

PERFORMANCE, ORDERING AND INSTALLATION GUIDE

ORDERING DATA--SPECIFY PIPE SIZE, TYPE, FLUID, OPERATING PRESSURE, TEMPERATURE RANGE, ELECTRICAL SPECIFICATIONS, BACK PRESSURE (IF ANY).

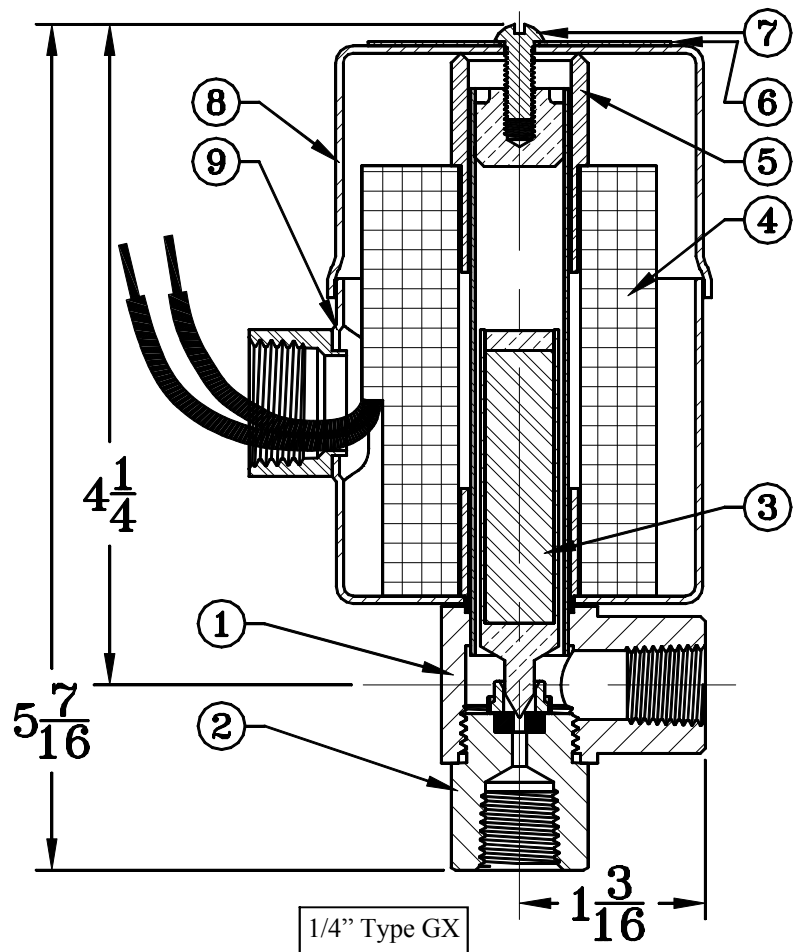
FLOW CHARACTERISTICS--SEE FLOW CURVES IN BULLETIN 5-FL, OR C_v FACTORS LISTED BELOW AND IN BULLETIN CP-1.

OPERATION--DIRECT ACTING FOR OPERATION FROM 0 TO RATED PRESSURE.

MOUNTING--MOUNT IN HORIZONTAL LINE WITH COIL VERTICAL AND ON TOP. INSTALL 40 MESH STRAINER (NOT LARGER) AHEAD OF VALVE. CHECK FOR PROPER COIL VOLTAGE. MAKE SURE THAT THE FLOW INLET IS ON THE SIDE AND THE OUTLET IS DOWN.

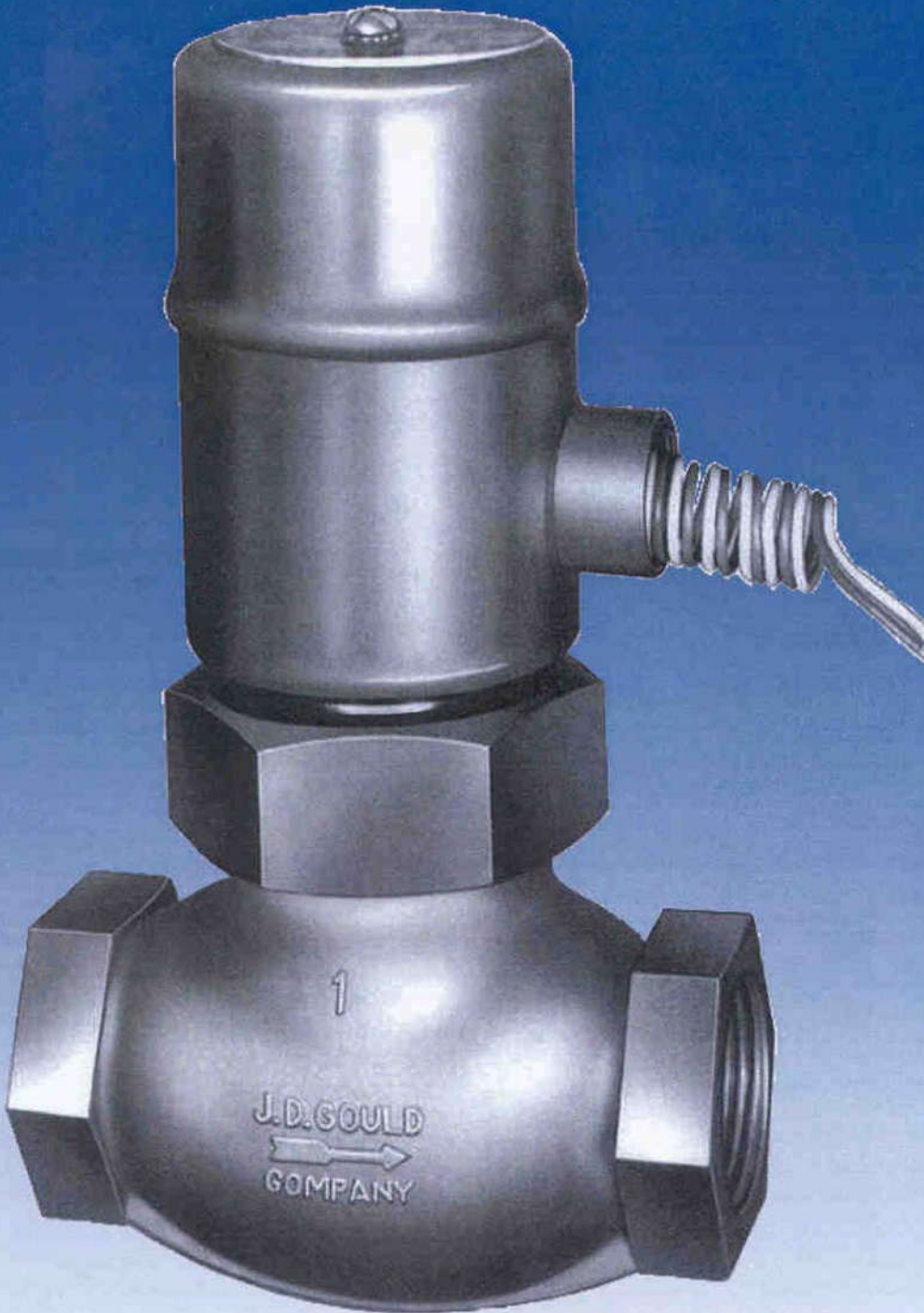
SERVICING--SOLENOID VALVES SHOULD BE FREQUENTLY CHECKED FOR OPERATION, CLEANLINESS, & INTERNAL WEAR - REPAIR KITS ARE FACTORY AVAILABLE --GIVE SIZE, TYPE, SERIAL NUMBER OR OPERATING DATA (VOLTAGE, PRESSURE, ETC.)

#	Part Description	NEMA Rating	TYPES G, -2,-24,-25		
			1/8"	1/4"	3/8"
1	Body	1	P1801GX	P1802GX	P1803GX
	XP Body	4, 5, 7	P1801GXXP	P1802GXXP	P1803GXXP
	N.O. Body	1	P1801GRX	P1802GRX	P180GRX
	N.O. XP Body	4, 5, 7	P1801GRXXP	P1802GRXXP	P1803GRXXP
2	Body Nut	ALL	1811GXx	1812GXx	1813GXx
3	Pilot Assembly	1	P2421	P2421	P2421
	XP Pilot Assembly	4, 5, 7	P2421	P2421	P2421
	N.O. Pilot Assembly	1	P242R4	P242R4	P242R4
	N.O. XP Pilot Assembly	4, 5, 7	P242R4	P242R4	P242R4
4	Coil	ALL			
5	Top Nip	1	115-2	115-2	115-2
	XP End Plate	4, 5, 7	113	113	113
	N.O. Top Nip	1	115-3	115-3	115-3
6	Nameplate	ALL	44-1x	44-1x	44-1x
7	Screw	ALL	9	9	9
8	Coil Cover	1	89	89	89
	XP Coil Cover	4, 5, 7	42NC	42NC	42NC
	N.O. Coil Cover	1	89NO	89NO	89NO
	N.O. XP Coil Cover	4, 5, 7	42NO	42NO	42NO
	Bolts	4, 5, 7	9-4	9-4	9-4
	Washers	4, 5, 7	46-3	46-3	46-3
9	Coil Housing	1	87	87	87
	XP Coil Housing	4, 5, 7	41A	41A	41A



Physical Dimensions										
Orifice	3/64"	1/16"	5/64"	3/32"	7/64"	1/8"	5/32"	3/16"	7/32"	1/4"
C _v	0.05	0.08	0.12	0.18	0.26	0.30	.50	.70	1.00	1.20
Shipping Weight for all NEMA 1 Type GX Valves is 3 lbs										
Shipping Weight for all NEMA 4, 5, & 7 Type GX (-2) Valves is 7 lbs										
For Height Values of NEMA 4, 5, & 7 Valves Add 0.69"										
For Height Values of Normally Open Valves Add 1.00"										
For Height Values of Normally Open, NEMA 4, 5, & 7 Valves Add 1.75"										

Technical Bulletins



Solenoid Valves

J.D. Gould Company, Inc.

J. D. Gould Company, Inc. www.mmcontrol.com/gouldvalve

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• e-mail: sales@mmcontrol.com

SOLENOID VALVES

GENERAL INSTALLATION & OPERATING INSTRUCTIONS

DESCRIPTION AND OPERATION:

TYPES A, B, D, K, M & Q are internal PISTON, PILOT OPERATED solenoid valves and require a 5, 10 or 20 PSI MINIMUM OPERATING PRESSURE DIFFERENTIAL. When the coil is energized on NORMALLY CLOSED valves, it lifts the pilot valve off the seat screw, opening the pilot orifice through the center of the piston to the outlet side of the valve. This relieves the pressure from the top of the piston ring and pressure under the piston ring forces the piston up to open the main valve orifice. When the coil is de-energized, the pilot valve returns to close the pilot orifice and pressure across the piston ring is equalized through a timing orifice in the side of the piston or in the valve body. The piston spring returns the piston to close the main valve orifice.

TYPES F, G, GX, B3, AD, QD, & KD are DIRECT ACTING solenoid valves and do not require a minimum operating differential pressure. When the coil is energized on NORMALLY CLOSED valves, it lifts the solenoid plunger, which is mechanically connected to the valve seat and lifts it to open the main valve orifice. When the coil is de-energized, gravity and flow return the valve seat to close the main valve orifice.

NORMALLY CLOSED valves OPEN when the coil is energized. NORMALLY OPEN valves (indicated by the letter R after the basic type designation) CLOSE when the coil is energized. The PILOT VALVE ONLY is normally open on piston pilot operated solenoid valves. The PISTON opens only with application of PRESSURE.

ALL Standard valves are supplied with CONTINUOUS DUTY COILS of the proper class of insulation for the service indicated on the nameplate. The COIL TEMPERATURE after being energized for extended periods, although uncomfortably warm to touch, is a safe operating temperature. Smoke or burning odor indicates excessive coil temperature.

INSTALLATION:

Install in HORIZONTAL pipe with the COIL ASSEMBLY on TOP AND VERTICAL with FLOW ARROW or IN AND OUT markings in the proper direction. ALL PIPING should be blown clear before installation and a 40 mesh STRAINER should be installed ahead of the valve, STEAM LINES should be properly TRAPPED at the valve inlet. PIPE DOPE is NOT recommended, but if used should not be applied to the VALVE BODY. Apply sparingly to the pipe threads only. J. D. Gould Company recommends Teflon™ tape for all connections. PIPING should be properly aligned and supported to avoid strain on the valve body. The VALVE BODY should not be held in a VISE except across the pipe ends. Use a PIPE VISE or WRENCH on the pipe and a WRENCH on the HEX PIPE ENDS. DO NOT use the COIL ASSEMBLY for a LEVER to tighten piping.

WIRING:

ALL COIL HOUSINGS have 1/2" THREADED CONDUIT connectors. Check the NAMEPLATE for PROPER VOLTAGE and connect the COIL LEAD WIRES to line voltage in accordance with applicable ELECTRICAL CODES. The LEAD WIRES are not polar, and either may be connected to pos (+) or neg (-). The GREEN wire (when equipped) should be connected to ground. Standard NEMA 1 enclosures, (except Type B3) do not require a separate wiring JUNCTION BOX. Wiring can be run through the conduit connection in the COIL HOUSING and connected to the COIL LEADS inside COIL COVER. DUAL VOLTAGE COILS must be wired in accordance with the DIAGRAM shown on the coil housing. Standard COIL HOUSING may be rotated as required to facilitate wiring. EXPLOSION PROOF HOUSINGS are FIXED and CANNOT be ROTATED except on valves equipped with UNION BONNETS. TORQUE for EXPLOSION PROOF HOUSING BOLTS is 15 ft•lbs.

SPEED ADJUSTMENT & MANUAL OPEN OPTION TYPES B & D ONLY:

Adjustments are pre-set at the factory to meet average conditions (or to your specifications); however, individual requirements in the field may necessitate further adjustment. To increase opening speed or decrease closing speed, turn stem at base marked ADJ. clockwise (IN). To decrease opening speed or increase closing speed, turn stem counterclockwise (OUT). On slow opening valves or high-pressure (above 300 PSIG) valves, this adjustment, if opened too far counter-clockwise, will create a situation in which the valve will fail to open. To correct this, close the ADJ. stem (clockwise) with pressure on and solenoid energized until valve opens.

For manual open, turn stem marked "MAN OPN" counter clockwise to open. Turn clockwise until seated to close.

FLOW CONTROL (Type D with NEMA 1 Coil Enclosure ONLY)

Valves are set at factory for full flow unless otherwise specified. To adjust flow rate thru valve, relieve line pressure ahead of valve and loosen nameplate screw. It is not necessary to disconnect wiring or remove coil. Turn bonnet (clockwise) to reduce flow. No wrench is needed if pressure is off system. With bonnet down as far as possible, approximately 25% full flow is obtained. To obtain full flow, back the bonnet off (counter-clockwise) 3 turns for ¾"-1" valves; 4½ turns for 1¼"-1½" valves; or 6 turns for 2" valves. At this position, arrows (or stamped "½" on 1¼"-1½" valve) on body and bonnet are in line and bottom of bonnet is just above full flow line on body. Do not open bonnet above this line. After proper adjustment is made, tighten nameplate screw. (Note: some older valves may have a set-screw to lock the bonnet in place. This must be loosened before adjustment.)

MAINTENANCE:

Close the supply SHUT OFF VALVE and ENERGIZE the SOLENOID VALVE to de-pressurize the inlet supply line. DISCONNECT ELECTRICAL POWER before removing the COIL ASSEMBLY. The COIL will overheat and burn out if left ENERGIZED without the entire SOLENOID ASSEMBLY in place. Since OCCASIONAL INSPECTION AND CLEANING is desirable, be sure to add the valves to your scheduled maintenance program. Flowing media and cycle rate will determine the desired interval between inspections. Removing the BONNET exposes the internal parts of the valve. It is not necessary to remove the VALVE BODY from the line for inspection or repairs. Valve parts may be cleaned in commercial products such as Lime-Away® or CLR™ to remove mineral deposits. Be sure any cleaning solution is compatible with BOTH the metallic and non-metallic (seats & seals) components. Parts should be rinsed thoroughly in clean running water before re-assembly.

BOLT TORQUE for valves with bolt-on bonnets is as follows:

1¼" & 1½"	Type K & KX	60 ft•lb
2"	Type K & KX	70 ft•lb

Refer to INDIVIDUAL BULLETINS for ASSEMBLY DRAWINGS AND PARTS LIST.

INSPECTION CHECK LIST:

VOLTAGE must be within +10% to -15% of the nominal voltage indicated on the nameplate. To check the SOLENOID OPERATION energize and de-energize the solenoid several times. An audible CLICK indicates the solenoid is working properly. If no click is heard, check SUPPLY VOLTAGE. If voltage supply at the coil is proper, check the COIL for open or shorted turns with an OHMMETER.

The pilot valve PLUNGER must be free to move in the BONNET PILOT TUBE. The TUBE must be straight and perpendicular to the BONNET FACE and not kinked, bent or deformed. The PISTON ASSEMBLY should move freely in the cylinder bore with the application very little force. The PISTON RING should be free in the ring groove and the metal EXPANDER under the piston ring should hold the piston ring in contact with the cylinder bore.

The END GAP in the step cut of the piston ring should never be less than .020". The SEAT SCREW pilot orifice should be round and free from nicks, burrs or erosion. The DISC and main orifice SEAT should not be worn or chipped. The cylinder bore in the valve BODY should be round, smooth and free from wear, nicks or gouges.

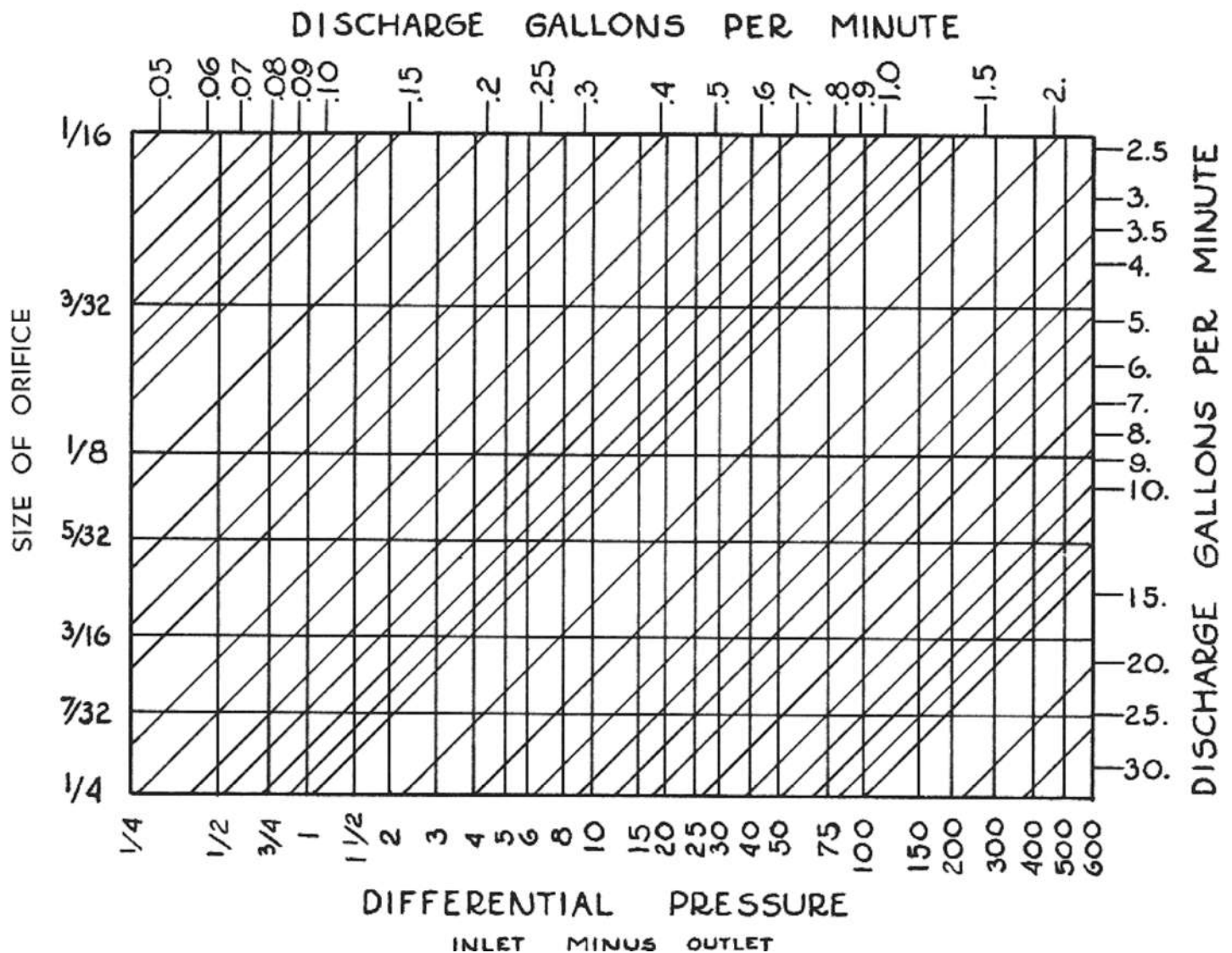
REPLACEMENT PARTS:

After inspection, replace all worn or damaged parts. REPAIR KITS are available from stock or from local Sales Representatives. Refer to individual SOLENOID VALVE BULLETINS for description and part numbers. Some individual REPAIR PARTS are also available for special repair requirements.

SEE "SOLENOID VALVE SELECTOR" ON OUR WEBSITE
TO CALCULATE FLOW OR PRESSURE DROP

See Individual Bulletins for CV Factors

WATER CAPACITY FOR FRACTIONAL ORIFICES



AIR AND GAS CAPACITY CHART FOR GOULD VALVES

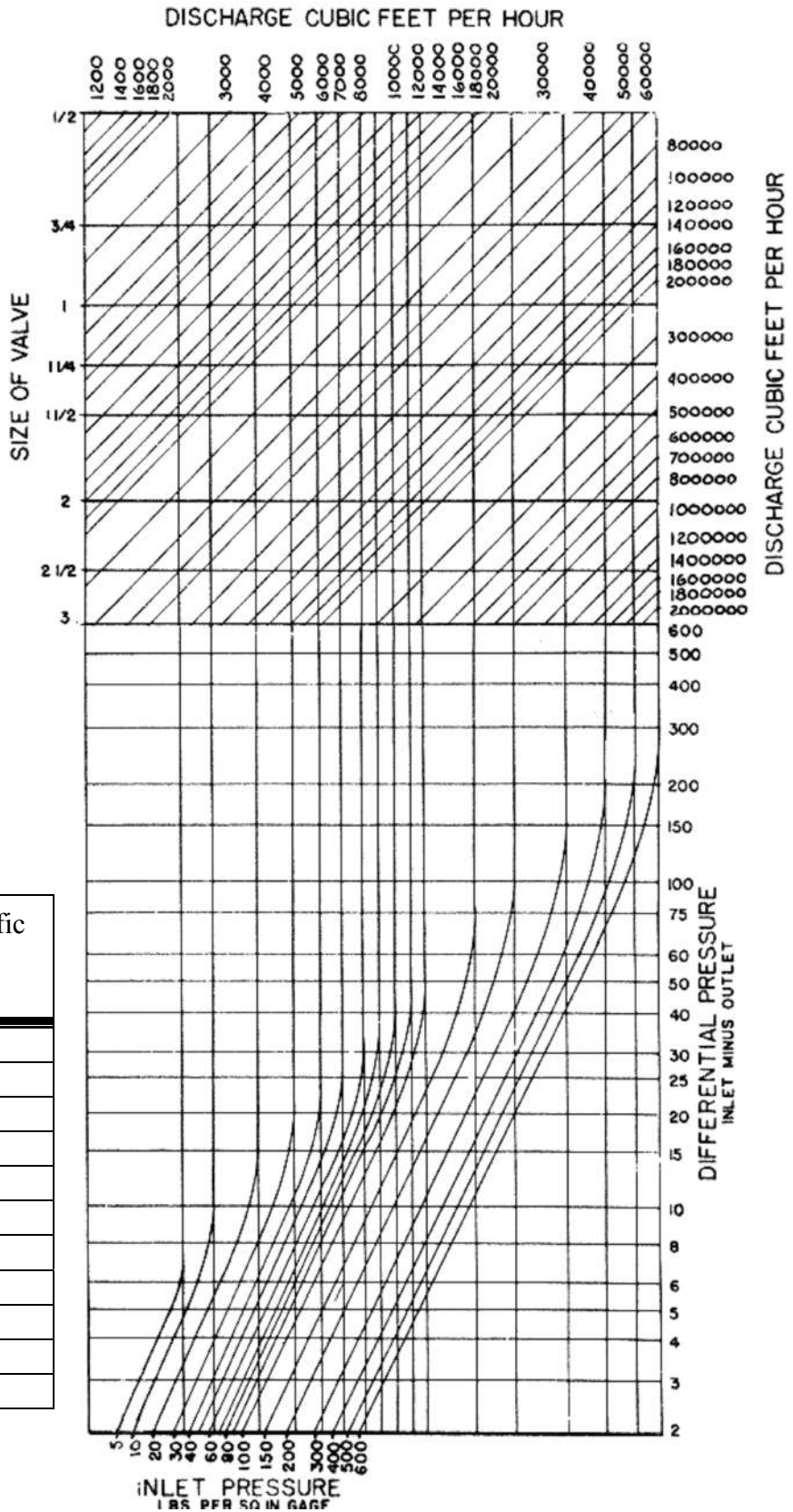
SEE "SOLENOID VALVE SELECTOR" ON OUR WEBSITE TO CALCULATE FLOW OR PRESSURE DROP

To Determine Capacity:

- 1> Locate differential pressure on scale at right of chart.
- 2> From this point cross horizontally to the proper inlet pressure curve.
- 3> Move vertically from this intersection to the horizontal line indicating valve size.
- 4> The diagonal line at this intersection indicates maximum valve capacity.

To Determine Valve Size:

- 1> Find the intersection of the differential pressure line and inlet pressure curve.
- 2> Move vertically to the diagonal line of desired capacity.
- 3> The horizontal line at this intersection indicates proper valve size.



To correct capacity for gases with specific gravity other than 1.0, multiply by the following factors.

Specific Gravity	Factor
.6	1.29
.7	1.20
.8	1.12
.9	1.05
1.0	1.00
1.1	0.95
1.2	0.91
1.3	0.88
1.4	0.85
1.5	0.82

LIQUID CAPACITY FOR GOULD VALVES

See "Solenoid Valve Selector" on our website to calculate Flow and Pressure Drop

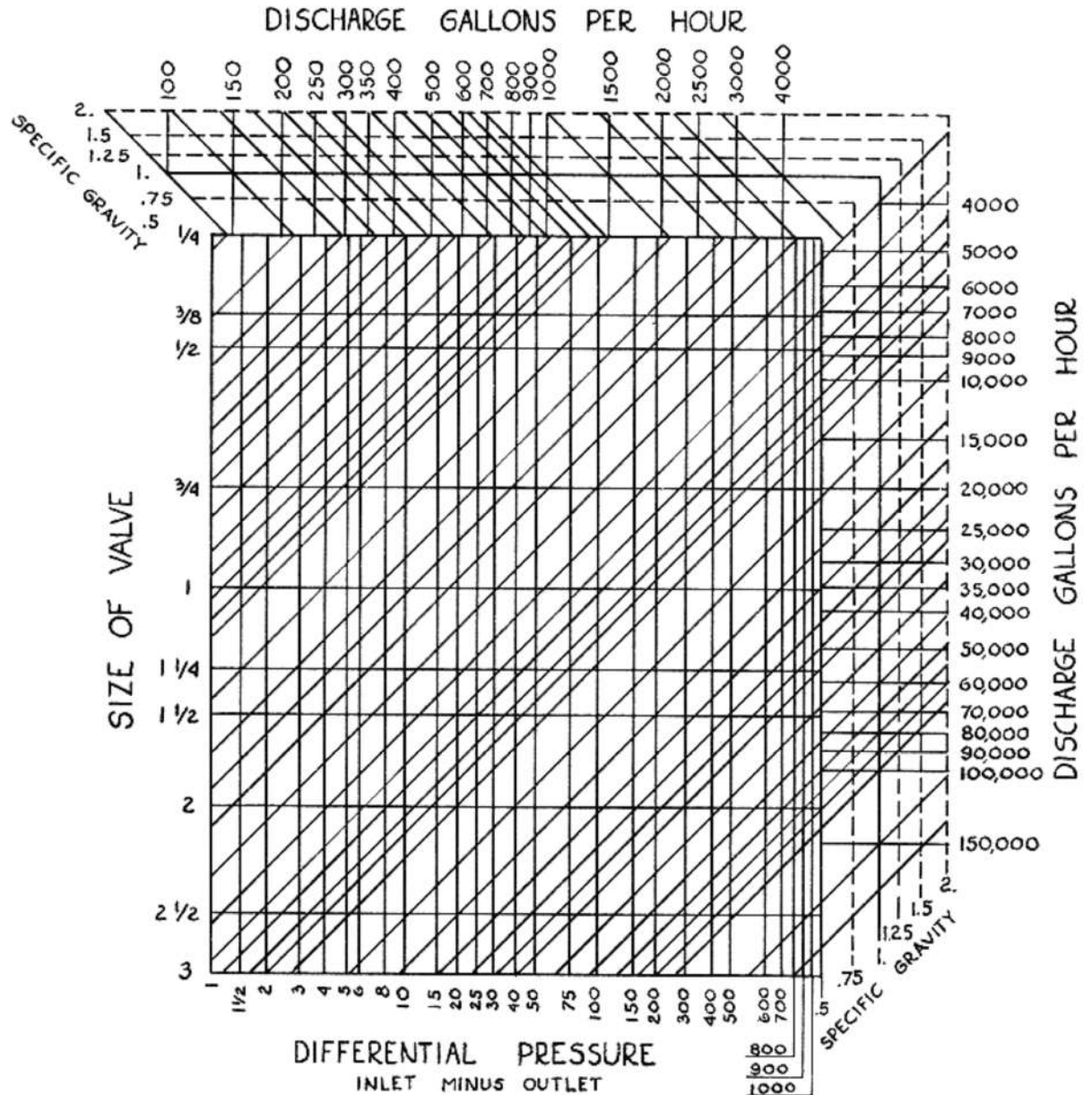
CONVERSION TABLE	
Deg. API	Sp. Gr. 60°/60°F
10	1.0000
12	0.9861
14	0.9725
16	0.9593
18	0.9465
20	0.9340
22	0.9218
24	0.9100
26	0.8984
28	0.8872
30	0.8762
32	0.8655
34	0.8550
36	0.8448
38	0.8348
40	0.8250
42	0.8156
44	0.8062
46	0.7972
48	0.7882
50	0.7796
52	0.7710
54	0.7628
56	0.7547
58	0.7467
60	0.7389
62	0.7313
64	0.7237
66	0.7165
68	0.7093
70	0.7022
72	0.6953
74	0.6886
76	0.6819
78	0.6754
80	0.6690
82	0.6628
84	0.6566
86	0.6506
88	0.6446
90	0.6388
92	0.6330
94	0.6275
96	0.6220
98	0.6165
100	0.6112

To Determine Capacity of Valve:

- 1> Locate differential pressure at bottom of chart.
- 2> Move vertically to horizontal line indicating valve size.
- 3> Follow diagonal line from this point to specific gravity lines at the top or right.
- 4> Capacity is shown at the intersection of the specific gravity and diagonal lines.

To Determine Valve Size for Given Capacity:

- 1> Locate intersection of desired capacity and specific gravity at the top or right.
- 2> Follow diagonal line from this intersection to vertical differential pressure line.
- 3> The horizontal line at this point indicates valve size.



Notes:

The diagonal lines indicating capacity change direction 90° at top of chart at 0.5 specific gravity.

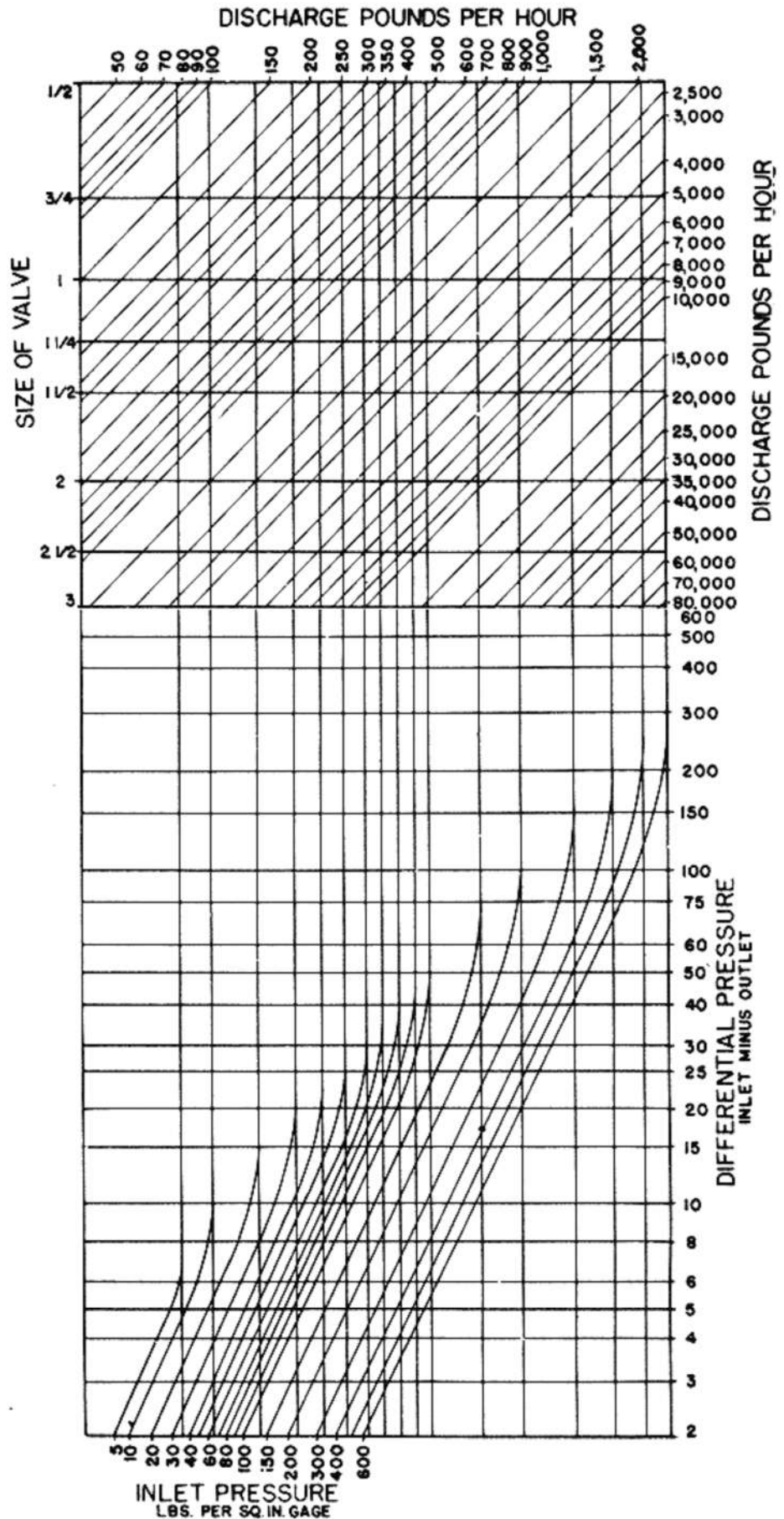
For hydraulic oil (viscosity 105 SSU @ 100°F) multiply discharge by 0.6 to obtain corrected capacity while using Specific gravity of 1.0.

STEAM CAPACITY CHART FOR GOULD VALVES

Also see "Solenoid Valve Selector" on our website to calculate Flow and Pressure Drop.

To Determine Capacity:

- 1> Locate differential pressure on scale at right of chart.
- 2> From this point cross horizontally to the proper inlet pressure curve.
- 3> Move vertically from this intersection to the horizontal line indicating valve size.
- 4> The diagonal line at this intersection indicates maximum valve capacity.



To Determine Valve Size:

- 1> Find the intersection of the differential pressure line and inlet pressure curve.
- 2> Move vertically to the diagonal line of desired capacity.
- 3> The horizontal line at this intersection indicates proper valve size.